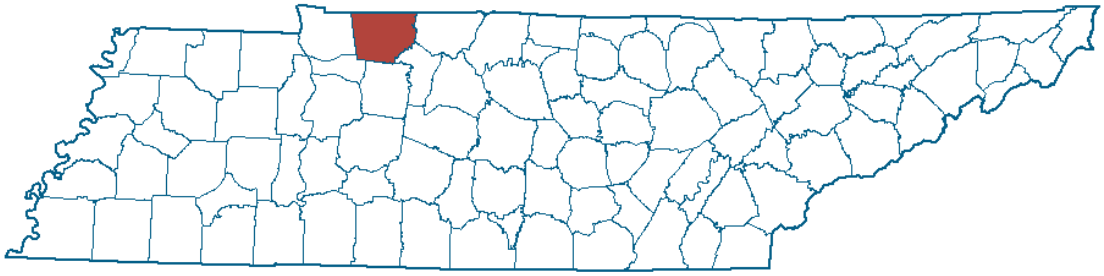
Clarksville – Montgomery County

Technology Action Plan

Prepared by

Clarksville – Montgomery County Technology Planning Team and Connected Tennessee



ACCESS ADOPTION USE

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INTRODUCTION

The purpose of this report is to summarize the community's assessment of local broadband access, adoption, and use, as well as the best next steps for addressing any deficiencies or opportunities for improving the local technology ecosystem.

Background

Today, technology plays a pivotal role in how businesses operate, the type of service consumers expect, how institutions provide services, and where consumers choose to live, work, and play. The success of a community has also become dependent on how broadly and deeply the community adopts technology resources, which includes access to reliable high-speed networks, digital literacy of residents, and the use of online resources locally for business, government, and leisure. As noted in the National Broadband Plan (NBP), broadband Internet is "a foundation for economic growth, job creation, global competitiveness and a better way of life."[1]

Despite the growing dependence on technology, the United States Census reports that 27% of Americans do not have a high-speed connection at home.[2] Connected Nation's studies also indicate that 19.1 million children do not have broadband at home, and 6.1 million of those children live in low-income households.[3]

In 2014, Connected Nation also surveyed 4,206 businesses in 7 states. Based on these data, Connected Nation estimates that at least 1.5 million businesses (20%) in the United States do not use broadband technology today.[4]

Deploying broadband infrastructure, services, and application, as well as supporting the universal adoption and meaningful use of broadband, are challenging – but required – building blocks of a twenty-first century community. To assist communities, Connected Nation developed the Connected Community Engagement Program to help your community identify local technology assets, complete an assessment of local broadband access, adoption, and use, and develop an action plan for pursuing solutions.[5]

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[1] *Connecting America: The National Broadband Plan,* Federal Communications Commission, April 2010, http://www.broadband.gov/download-plan/.

[2] United States Census Bureau's American Community Survey Report, "Computer and Internet Use in the United States: 2013." http://www.census.gov/content/dam/Census/library/publications/2014/acs/acs-28.pdf.

[3] National estimates calculated using Connected Nation's 2014 Residential Technology Assessments.

[4] Estimates based on Connected Nation's *2014 Business Technology Assessment* (http://www.connectednation.org/survey-results/business) and 2013 County Business Pattern data from the United States Census Bureau (http://www.census.gov/econ/cbp/)

[5] Connected Nation, parent company of Connected Tennessee, is a national non-profit 501(c)(3) organization that works in multiple states to engage community stakeholders, state leaders, and technology providers to develop and implement

To fulfill Congress's mandate, the National Broadband Plan, makes recommendations to the FCC, the Executive Branch, Congress, and state and local governments that positively influence the broadband ecosystem – networks, devices, content, and applications - in four ways:

1. Provides entrepreneurial support.
2. Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
3. Promotes business growth and workforce development.
4. Broadband empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets.

technology expansion programs with core competencies centered around the mission to improve digital inclusion for people and places previously underserved or overlooked.

Methodology

By actively participating in the Connected Community Engagement Program, Clarksville – Montgomery County Technology Planning Team is boosting the community's capabilities in education, healthcare, and public safety, and stimulating economic growth and spurring job creation. Clarksville – Montgomery County Technology Planning Team has collaborated with multiple community organizations and residents to:

1. Empower a community team leader (local champion) and create a community team composed of a diverse group of local residents from various sectors of the economy including education, government, healthcare, the private sector, and libraries.
2. Identify the community's technology assets, including local infrastructure, providers, facilities, websites, and innovative uses employed by institutions.
3. Complete the Connected Assessment, a measurement of the community's access, adoption, and use of broadband based on the recommendations of the National Broadband Plan.
4. Match gaps in the local broadband ecosystem to solutions and best practices being utilized by communities across the nation.
5. Pursue Connected certification, a nationally recognized platform for spotlighting communities that excel in the access, adoption, and use of broadband.

Clarksville – Montgomery County Technology Planning Team

CONNECTED ASSESSMENT

The Connected assessment framework is broken into 3 areas: ***ACCESS***, ***ADOPTION,*** and ***USE***. Each area has a maximum of 40 points. To achieve Connected certification, the community must have at least 32 points in each section and 100 points out of 120 points overall.

The ***ACCESS*** focus area checks to see whether the broadband and technology foundation exists for a community. The criteria within the ***ACCESS*** focus area endeavor to identify gaps that could affect a local community broadband ecosystem including last and middle mile issues, cost issues, and competition issues. As noted in the National Broadband Plan, broadband ***ACCESS*** "is a foundation for economic growth, job creation, global competitiveness and a better way of life."

Broadband ***ADOPTION*** is important for consumers, institutions, and communities alike to take the next step in fully utilizing broadband appropriately. The ***ADOPTION*** component of the Connected Assessment seeks to ensure the ability of all individuals to access and use broadband.

Broadband ***USE*** is the most important component of ***ACCESS***, ***ADOPTION,*** and ***USE*** because it is where the value of broadband can finally be realized. However, without ***ACCESS*** to broadband and ***ADOPTION*** of broadband, meaningful ***USE*** of broadband wouldn't be possible. As defined by the National Broadband Plan, meaningful ***USE*** of broadband includes those areas of economic opportunity, education, government, and healthcare where values to individuals, organizations, and communities can be realized.

Analysis of Connected Assessment

The Community Technology Scorecard provides a summary of the community's Connected Assessment. The Connected Assessment's criteria are reflective of the recommendations made by the Federal Communications Commission's National Broadband Plan. These scores reflect the community's progress toward meeting these universal fixed broadband service national benchmarks, ubiquitous mobile service, and growing access to higher speed next-generation services. Lower scores do not necessarily signify a complete lack of access to broadband service but instead reflect that the broadband infrastructure in the community has not met these national goals and benchmarks.

Community Technology Scorecard Brief

The Community Technology Scorecard provides a summary of the community's Connected Assessment.

- The community scored 34 out of a possible 40 points in broadband access primarily because of the lack of middle mile access.
- The community scored 34 out of a possible 40 points in broadband adoption. This score indicates an opportunity for improved computer access and more digital literacy programs in the community to increase efforts for overcoming local barriers to home broadband subscription.
- The community scored 37 out of a possible 40 points in broadband use. This score indicates that Clarksville has effectively employed broadband to deliver productive online services and applications to help improve the overall quality of life for local residents and businesses.
- Clarksville achieved a score of 105 points out of 120 for overall broadband and technology readiness, which indicates that the community is exhibiting strong support of technology access, adoption, and use and has surpassed the score of 100 required for Connected certification.
- Clarksville exceeded the 32 points in each focus area that are required for certification and has qualified for full certification.

Community Technology Scorecard

Community Technology Scorecard Community Champions: Cal Wray and Christy Batts Community Advisor: Deanna Ward				
FOCUS AREA	**ASSESSMENT CRITERIA**	**DESCRIPTION**	**SCORE**	**MAXIMUM POSSIBLE SCORE**
ACCESS	Broadband Availability	99.98% of homes have access to 3 Mbps	10	10
	Broadband Speeds	99.98% of households with access to at least 50 Mbps	5	5
	Broadband Competition	97.96% of households with access to more than 1 broadband providers	5	5
	Middle Mile Access	Availability of broadband at speeds of at least 50 Mbps download	4	10
	Mobile Broadband Availability	99.99% of households have access to mobile broadband	10	10
	ACCESS SCORE		34	**40**
ADOPTION	Digital Literacy	Program grads are greater than 4 per 1,000 residents over the past year	6	10
	Public Computer Centers	450 computer hours per 1,000 low-income residents per week	8	10
	Broadband Awareness	Campaigns reach 100% of the community	10	10
	Vulnerable Population Focus	At least 5 groups	10	10
	ADOPTION SCORE		34	**40**
USE	Economic Opportunity	5 advanced, 5 basic uses	10	10
	Education	3 advanced, 6 basic uses	10	10
	Government	3 advanced, 3 basic uses	9	10
	Healthcare	2 advanced, 4 basic uses	8	10
	USE SCORE		37	**40**
	COMMUNITY ASSESSMENT SCORE		105	**120**

Itemized Key Findings

Clarksville identified the following key findings (in addition to findings illustrated in the community scorecard) through its technology assessment:

ACCESS

- 14 last mile broadband providers currently provide service in Clarksville:
  - 99.98% of households have access to 3 Mbps
  - 99.98% of households have access to at least 50 Mbps
  - 97.96% of households have access to more than 1 broadband provider
- Availability of middle mile fiber infrastructure from 0 providers
- 99.99% of households with access to mobile wireless

ADOPTION

- 4 Digital Literacy Programs exists in the community resulting in 654 Program grads over the past year
- 7 Public Computer Centers (PCC) with a total of 200 computers available to the public
- 9 Broadband Awareness Campaigns are reaching 100% of Clarksville
- 5 organizations are working with vulnerable populations

USE

- At least 10 uses of broadband were identified in the area of economic opportunity including 5 advanced uses and 5 basic uses
- At least 9 uses of broadband were identified in the area of education including 3 advanced uses and 6 basic uses
- At least 6 uses of broadband were identified in the area of government including 3 advanced uses and 3 basic uses
- At least 6 uses of broadband were identified in the area of healthcare including 2 advanced uses and 4 basic uses

In addition to the items identified above, the Clarksville identified the following technology resources in the community:

Technology Providers

- 14 broadband providers were identified in Clarksville
- 0 hardware providers were identified in Clarksville
- 0 network developers were identified in Clarksville
- 1 web developer was identified in Clarksville

Technology Facilities

- 2 public computer centers
- 2 wireless hotspots
- 0 videoconference facilities

Community Websites

- 2 Business-related websites (excluding private businesses)
- 4 Education-related websites
- 9 Government-related websites
- 4 Healthcare-related websites
- 1 Library-related website
- 0 Tourism-related websites
- 1 Agriculture-related website
- 2 Community-based-related websites

Clarksville Priority Projects

The Connected Assessment has culminated in the outlining of projects designed to empower the community to accelerate broadband access, adoption, and use. There are 6 projects that the community has identified as priority projects.

Priority Projects Identified by the Clarksville – Montgomery County Team
1. Identify and Expand Wireless Hotspots in the Community
2. Facilitate Internet Safety Classes
3. Establish a Community Technology Academy
4. Deploy Educational WiMAX
5. Provide Incentives to Encourage Computer Purchases Among Students
6. Improve Campus Connectivity

Clarksville Additional Projects

The table below shows the complete list of the 33 projects the Clarksville – Montgomery County Technology Planning Team proposes to undertake in order to accelerate broadband access, adoption, and use in Clarksville. Detailed descriptions of each solution proposed by Connected Tennessee can be found in the *Action Plan* section of this report.

Additional Projects Identified by the Clarksville - Montgomery County Technology Planning Team		
Access	Broadband Availability	Identify, Map, and Validate Broadband Demand
		Perform an Analysis of Local Policies and Ordinances
	Middle Mile Access	Develop and Issue a Request for Proposal (RFP) for Build-Out
		Develop Public-Private Partnerships to Deploy Broadband Service
		Study and Possibly Reassess Major Telecom Purchase Contracts
	Mobile Broadband Availability	Improve Campus Connectivity
		Complete a Vertical Assets Inventory
Adoption	Digital Literacy	Distribute Digital Literacy Content
		Develop a Technology Mentorship Program
	Public Computer Centers	Initiate a Community Computer Refurbishment or Recycling Program
		Procure a Multipurpose Mobile Technology Center
	Broadband Awareness	Implement a Community-Based Technology Awareness Program
		Facilitate a Technology Summit
Use	Economic Opportunity	Create a Main Street Portal (Community Portal)
		Develop a Farmers Network
		Develop a Tourism Portal
		Online Identification of Broadband Services at Key Economic Sites
		Host Website and Social Media Classes for Local Businesses
		Create a Telework Support and Attractions Program
		Develop or Identify a Broadband Training and Awareness Program for Small and Medium Businesses
		Create Local Jobs Via Teleworking Opportunities
	Education	Develop Technology Working Groups
		Offer Professional Development Programs for Teachers on Classroom Applications
		Improve Education Through Digital Learning
		Connect All School Classrooms to the Internet
		Improve Educational Technology Hardware
		Improve Access to Online Education Opportunities
	Government	Improve Public Safety Communications
		Perform a Municipal Information Technology Assessment
		Improve the Online Presence of Government
		Improve Online Business Services Offered by the Government
		Pursue Next General 911 Upgrades
	Healthcare	Promote Telemedicine in Remote Areas

DETAILED FINDINGS

Current Community Technology Developments in Clarksville

- The team is working with the library on plans to offer an Internet safety program for teens to help them understand the power of social media. We plan to share with them some of the dangers it may bring if not used with caution and how to protect themselves while still enjoying the social media platforms.
- The team has identified a kiosk manufacturer that will work with the City of Clarksville to provide WiFi access within a 150 radius of the individual kiosk. Additionally, the kiosks will serve as an information site for tourism, history, restaurants, and retail. They would be placed strategically throughout downtown, parks, and other areas for maximum exposure and enhanced WiFi reach.
- The industrial site (IDB - www.clarksvilletned.com) is designed to allow business and industry to learn about the community to see if it fits their needs. It describes the community and shows the existing business community and what makes it up. It shows what can be done to help businesses to expand and locate in the community. Also, it has a GIS function that shows available land and buildings as well as creates reports including demographics. It looks at a labor market assessment and provides an in-depth study on that labor market. It describes the functions and capability of the IDB.

Clarksville Assessment Findings

Today, residents in Clarksville (or sections of the community) are served by 14 providers. At the time of broadband assessment, broadband was defined as Internet service with advertised speeds of at least 768 Kbps downstream and 200 Kbps upstream. According to Connected Tennessee's latest broadband mapping update, the following providers have a service footprint in Clarksville.

Broadband Providers	Website	Technology Type
AT&T Mobility LLC	http://www.wireless.att.com	Mobile Wireless
AT&T Tennessee	http://www.att.com	DSL
Charter Communications Inc.	http://www.charter.com	Cable
CDE Lightband	http://www.clarksvillede.com	Fiber
Comcast	http://www.comcast.com	Cable
Cricket Wireless	http://www.leapwireless.com	Mobile Wireless
Hughes Network Systems, LLC	http://www.hughes.com/	Satellite

Level 3 Communications, LLC	http://www.level3.com/	Fiber
Skycasters	http://www.skycasters.com	Satellite
StarBand Communications	http://www.spiritbb.com	Satellite
Sprint	http://www.sprint.com	Mobile Wireless
T-Mobile	http://www.t-mobile.com/	Mobile Wireless
Verizon Wireless	http://www.verizon.com	Mobile Wireless
ViaSat, Inc.	http://www.wildblue.com	Satellite

Below is a list of organizations that are making technological resources available to the community. These resources may include videoconferencing, public computing, and/or wireless hotspots.

Organization Name	Website	Resource Type
Clarksville Career Center	www.jobs4tn.gov	Public Computer Facility
Clarksville Public Library	www.mcgtn.org/library	Public Computer Facility

Below is a list of community websites (sorted by category) designed to share and promote local resources.

Organization Name	Website	Category
Ag Extension	www.extension.tennessee.edu/montgomery/pages/default.aspx	Agriculture
Clarksville Area Chamber of Commerce	www.clarksvillechamber.com	Business
Clarksville Young Professionals	www.clarksvilleyps.com	Business
Goodwill	www.giveit2goodwill.org	Community Based
Goodwill Career Solutions	www.goodwillcareersolutions.org	Community Based
Austin Peay State University	www.apsu.edu	Education
Clarksville-Clarksville School System	www.cmcss.net	Education
Nashville State Community College	www.nscc.edu/about/our-locations-and-maps/clarksville/	Education
Tennessee College of Applied Technology-Dickson	www.tcatdickson.edu	Education
Adult Literacy Council	www.adultliteracycouncil.org/	Government
City of Clarksville	www.cityofclarksville.com	Government
Clarksville-Clarksville Economic Development Council	www.clarksvillepartnership.com	Government
Clarksville Department of Electricity	www.clarksvillede.com	Government
Cumberland Electric Membership Cooperative	www.cemc.org	Government
Fort Campbell Army Post	www.campbell.army.mil	Government

Industrial Development Board of Clarksville	www.clarksvilletned.com	Government
Montgomery County	www.mcgtn.org	Government
Clarksville Career Center	www.jobs4tn.gov	Government
Clarksville Convention and Visitors Bureau	www.visitclarksvilletn.com	Government
Workforce Essentials	www.workforceessentials.com	Government
Gateway Medical Center	www.todaysgateway.com	Healthcare
Gateway Medical Group	www.gatewaymedicalgroup.com	Healthcare
Premier Medical Group	www.premiermed.com	Healthcare
Premiere Medical Group	www.premieremed.com	Healthcare
Clarksville Library	www.mcgtn.org/library	Libraries
Visit Clarksville	Visitclarksvilletn.com	Tourism

Below is a list of local technology companies that are providing technical services or distributing/selling technical resources.

Company Name	Website	Provider Category
Thrive Creative Group	http://thinkthrive.com/	Web Developer

Connected Assessment Analysis

Access Score Explanation

Broadband Availability (10 out of 10 Possible Points). Broadband Availability is measured by analyzing provider availability of 3 Mbps broadband service gathered by Connected Nation's broadband mapping program. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the October 2014 data collected by Connected Tennessee, 99.98% of Clarksville residents had access to broadband speeds of 3 Mbps or greater.**

Broadband Speeds (5 out of 5 Possible Points). Broadband Speeds are measured by analyzing the speed tiers available within a community. Data are collected by Connected Nation's broadband mapping program. The Connected Assessment analyzes broadband coverage by the highest speed tier with at least 75% of households covered. If broadband data is missing, the community team was able to improve the quality of data to ensure all providers are included.

- **According to the October 2014 data collected by Connected Tennessee, 99.98% of Clarksville residents had access to broadband speeds of 50 Mbps.**

Broadband Competition (5 out of 5 Possible Points). Broadband Competition is measured by analyzing the number of broadband providers available in the community and the percentage of that community's residents with more than one broadband provider available. Connected Nation performed this analysis by reviewing the data collected through its broadband mapping program. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the October 2014 data collected by Connected Tennessee, 97.96% of Clarksville residents had access to more than one broadband provider.**

Middle Mile Access (4 out of 10 Possible Points). Middle Mile Access is measured based on a community's availability to fiber. Three aspects of availability exist: proximity to fiber middle mile points of presence (POPs), number of POPs available, and available bandwidth. The community, in collaboration with Connected Nation, collected and analyzed middle mile access data.

- **Clarksville is served by 0 middle mile fiber providers.**

Mobile Broadband Availability (10 out of 10 Possible Points). Mobile Broadband Availability is measured by analyzing provider availability of mobile broadband service gathered by Connected Nation's broadband mapping program. In communities that may have mobile broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the October 2014 data collected by Connected Tennessee 99.99% of Clarksville residents had access to mobile broadband service.**

Adoption Score Explanation

Digital Literacy (6 out of 10 Possible Points). Digital Literacy is measured by first identifying all digital literacy programs in the community. Once the programs are identified, a calculation of program graduates will be made on a per capita basis. A digital literacy program includes any digital literacy course offered for free or at very low cost through a library, seniors center, community college, K-12 school, or other group serving the local community. A graduate is a person who has completed the curriculum offered by any organization within the community. The duration of individual courses may vary. A listing of identified digital literacy offerings is below.

Organization Name	Program Description	Number of Grads
Adult Literacy Council	Training in basic computer skills.	
Goodwill Career Solutions - 3 Locations	Digital literacy classes.	584
Clarksville Public Library	Multiple classes from basic computer skills to advanced skills such as Excel and PowerPoint.	
Austin Peay State University	Various classes related to using a computer, software, and the Internet offered as non-credit and at low cost. The classes are offered on-ground as well as online and thus are technically open at all times. Typical on-ground offerings meet a few hours per week. Lab will seat approximately 30 patrons at any given time.	70

Public Computer Centers (8 out of 10 Possible Points). Public Computer Centers is measured based on the number of hours computers are available each week per 1,000 low-income residents. Available computer hours are calculated by taking the overall number of computers multiplied by the number of hours open to a community during the course of the week. A listing of public computer centers available in Clarksville is below.

Organization Name	Number of Open Hours Per Week	Number of Computers	Available Computer Hours Per Week
Public Library	66	51	3,366
Clarksville Career Center	37.5	46	1,725
Goodwill Career Solutions - Madison Street	40	16	640
Goodwill Career Solutions - Fort Campbell	40	13	520
Goodwill Career Solutions - New Providence	40	14	560
APSU Center for Extended and Distance Education	40	30	1,200
APSU Woodward Library	84	30	2,520

Broadband Awareness (10 out of 10 Possible Points). Broadband Awareness is measured based on the percentage of the population reached. All community broadband awareness programs are first identified, and then each program's community reach is compiled and combined with other campaigns. A listing of broadband awareness programs in Clarksville is below.

Organization Name	Campaign Description	Community Reach
CMCSS	Digital Survey measuring connectivity to school systems.	50%
CMCSS	Email push to get parents signed into Powerschool and School Messenger.	50%
CDE Lightband	Promotion of online bill pay with bill stuffer, bill messages, and website information to include banner ads.	80%
City of Clarksville	Promotion of city essential services.	70%
Clarksville	Social Media Campaign to drive citizens to use online services.	90%
Workforce Essentials	Online services promoted to find jobs and submit job applications.	30%
Goodwill Career Solutions	Campaigns using bag stuffers, external signs, websites, and social media.	40%
APSU Center for Extended and Distance Education	Provide campaigns to students and faculty broadly throughout the year for distance education and general access to campus services.	10%
Premiere Medical	Promote access to patients at all physician office visits.	10%

Vulnerable Population Focus (10 out of 10 Possible Points). A community tallies each program or ability within the community to encourage technology adoption among vulnerable groups. Methods of focusing on vulnerable groups may vary, but explicitly encourage technology use among vulnerable groups. Example opportunities include offering online GED classes, English as a Second Language (ESL) classes, video-based applications for the deaf, homework assistance for students, and job-finding assistance. Communities receive points for each group on which they focus. Groups may vary by community, but include low-income, minority, senior, children, etc. Programs focusing on vulnerable populations in Clarksville are listed below.

Organization Name	Program Description	Vulnerable Group
Clarksville Career Center	Online Job Finding Assistance.	Unemployed
Clarksville-Clarksville School System	Homework Assistance and Teacher/Student Communication.	Children
Adult Literacy Council	Computer classes and programs designed for many vulnerable groups.	ESL Classes, Deaf, unemployed
APSU	Distance education tutoring services online through the Academic Support Center.	Low Income Students
APSU	Distance education course offerings through student support services.	Veterans
APSU	Every course and program offering and student support services are delivered in online formats.	Students with Disabilities

Use Score Explanation

Economic Opportunity (10 out of 10 Possible Points). A community receives one point per basic use of broadband and two points per advanced, or interactive, use of broadband. Categories within economic opportunity include: economic development, business development, tourism, and agriculture. Identified uses of broadband in the area of economic opportunity are listed below and identified as basic or advanced.

Application Provider	Description	Basic/Advanced
Agricultural Sites Online	Many sites available for agriculture: www.glci.org; www.tn.nacdnet.org; www.usb-extremebeans.com; www.picktnproducts.org; www.ag.tennessee.edu.	Basic
Online Banking	At least 10 local banks have free online banking available in the community.	Basic
Workforce Essentials Online Career Placement	Provides opportunities for career placement and resume building through their online portal.	Advanced
Attractions Online	Through the Chamber and CVB sites there are links to 75%+ of all County attractions; welcome center provides information as well.	Basic
Tourism Portal	CVB site and online promotion of activities and attractions.	Basic
Austin Peay Small Business Assistance Program	http://www.apsu.edu/ext-ed/tsbdc.	Advanced
Clarksville EDC	Gateway to many economic development opportunities and map to communities endeavors.	Basic
Tennessee Small Business Development Center	Online programs are offered to help small businesses with technology including software for accounting and business social media.	Advanced
APSU Center for Extended and Distance Education	Online programs offered to assist in workforce development training, leadership, management, and communication strategies.	Advanced
APSU Career Services	Online database of jobs and internships, appointments via Skye or Google Hangout for those who can't attend on campus, etc.	Advanced

Education (10 out of 10 Possible Points) A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within education include K-12, higher education, and libraries. Identified uses of broadband in the area of education are listed below and identified as basic or advanced.

Application Provider	Description	Basic/Advanced
Classroom Connectivity	100% of classrooms are connected to Internet via broadband with a 300 Mbps connection and a 1 Gig private backbone.	Basic
Library Connectedness	100% of libraries connected to Internet via broadband with a 300 Mbps connection and a 1 Gig private backbone.	Basic
Powerschool software	Online access to school curricula, homework, grades and ability to interact with teachers and administrators within CMCSS.	Advanced
Online Courses	Classes are available to students who are credit deficient or when certain classes are not available within the district.	Basic
Alexandria	Provides online access to school library catalogs.	Basic
Student Digital Literacy	High Schools have a ratio of 2 students per 1 computer. 100% of students are given an assessment for computer knowledge and skills.	Basic
Parent Interaction	100% of schools offer online interaction and 100% of parents have ability to use system. 81% of households are connected.	Advanced
Online Interaction	All employees and students are provided with an individual email address. Parents are also connected by email, text, and phone.	Basic
STEM Program	Grades 3-9 have been trained in STEM implementation. There is a dedicated STEM High School Academy and a STEM Magnet elementary.	Advanced

Government (9 out of 10 Possible Points). A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within government include general government, public safety, energy, and the environment. Identified uses of broadband in the area of government are listed below and identified as basic or advanced.

Application Provider	Description	Basic/Advanced
Smart Grid Electricity	CDE Lightband has over 70% of all meters connected via fiber for smart grid technology allowing for remote meter management.	Basic
Clarksville	Both the City of Clarksville and Clarksville have websites for all key departments and agencies.	Basic
Essential Government Services Online	Payment of utilities, taxes, and vehicle registration are all online. Online payments are also accepted for court fees.	Advanced
Ubiquitous, interoperable wireless public safety network	City Police use wireless connectivity for reporting and communications.	Advanced
City of Clarksville	All departments have websites for all major departments.	Basic
Ubiquitous, Interoperable Safety Network	EMS and MCSO utilize mobile services for dispatch, etc.	Advanced

Healthcare (8 out of 10 Possible Points). A community receives one point per basic use of broadband and two points per advanced use of broadband. Entities within healthcare can include, but are not limited to, hospitals, medical and dental clinics, health departments, nursing homes, assisted living facilities, and pharmacies. Identified uses of broadband in the area of healthcare are listed below and identified as basic or advanced.

Application Name	Description	Basic/Advanced
Remote Patient Monitoring	EMS has capability to send cardiac monitoring to hospitals in advance.	Advanced
E-health	All PMG doctors use EHR linked to patient portal.	Advanced
Online scheduling	Patients are given login to secure patient portal with full functionality.	Basic
Adequate bandwidth	All doctors have adequate bandwidth and 85% from home.	Basic
WiFi	All guests at offices have access to free Wifi.	Basic
Telemedicine	Established patients can send/receive a variety of secure messages, Rx requests, and lab results through patient portal.	Basic

ACTION PLAN

Complete List of Clarksville Projects

The following is a comprehensive list of the priority projects and additional projects the Clarksville – Montgomery County Technology Planning Team proposes to accelerate broadband access, adoption, and use in Clarksville. Detailed descriptions of each solution are provided.

ACCESS

Broadband Availability

Identify, Map, and Validate Broadband Demand

Goal
To understand existing and potential markets for broadband subscribers (both residential and business)

Project Description
Develop a team to conduct research surveys and market analyses to validate a business case. A market analysis includes research on the existing and potential service offerings and the respective rates to determine the levels of interest in the services and rate plans offered by the client. The team should provide accurate, timely, and thorough solutions, accompanied by personalized service to meet the needs of communities or broadband providers.

Benefits
1. Enables the ability to better understand the key drivers of the broadband market.
2. Validates the business case for network build-out and capacity investment.

Action Items
1. The project team should be prepared to provide research, project design, data collection services, data analysis and reporting, and presentation development and delivery.

   Example: HARBOR Inc. is a citizen-based, non-profit Michigan Corporation founded in 2001 and located in the City of Harbor Springs. The organization's broadband committee

developed and mailed a broadband demand survey in July 2012 to approximately 6,300 addresses, comprising all of the local property owners/residents in the community. A copy of the survey can be reviewed here: http://is0.gaslightmedia.com/wwwharborincorg/_ORIGINAL_/fs72-1369322556-20386.pdf

Perform an Analysis of Local Policies and Ordinances

Goal

Ensure that local policies are conducive to broadband build-out.

Project Description

High capital investment costs, including permit processing, pole attachment costs, and lack of effective planning and coordination with public authorities, negatively impact the case for deployment. For example, the FCC's National Broadband Plan concludes that, "the rates, terms, and conditions for access to rights-of-way [including pole attachments] significantly impact broadband deployment." The costs associated with obtaining permits and leasing pole attachments and rights-of-way is one of the most expensive cost functions in a service provider's plans to expand or upgrade service, especially in rural markets where the ratio of poles to households goes off the charts. Furthermore, the process is time consuming. "Make ready" work, which involves moving wires and other equipment attached to a pole to ensure proper spacing between equipment and compliance with electric and safety codes, can take months to complete.

Community and provider collaboration to problem solve around local pole attachment and other right-of-way issues is one of the most effective opportunities to encourage faster, new deployment of infrastructure.

Benefits

1. Lowers cost barriers to improve the business case for broadband deployment.
2. Encourages good public policy and provider relations.

Action Items

1. Review local policies, ordinances, and other barriers to broadband deployment and consult with community leaders, providers, utilities, and other members of the community to ensure that they are supporting policies (local ordinances, pole attachments, rights-of-way) that are conducive to broadband build-out.
2. Develop an awareness campaign targeted toward community leaders to inform them of the benefits of broadband to the entire community derived from access to global resources.

Deploy Educational WiMAX (community personalized)

Goal

Work with local educators at the university and the school system to identify areas where WiMax service would be beneficial in driving access to higher speed (1 Gigabit) broadband for the educational opportunities it can provide.

Project Description

Deploy WiMAX to the community and provide students with WiMAX-enabled laptops to ensure equal access for all students regardless of socioeconomic status. WiMAX is primarily a wireless and highly cost effective means of extending the school district's Intranet-based content and applications to the student body beyond the school campus and outside of school hours equating to anytime, anywhere instruction.

WiMAX is an IP-based, wireless broadband access technology that provides performance similar to Wi-Fi networks, but with the coverage and service quality of cellular networks. WiMAX can provide broadband wireless access (BWA) up to 30 miles (50 km) for fixed stations, and 3-10 miles (5-15 km) for mobile stations. Developing a WiMAX network should be done in partnership with providers, technology organizations, and local government.

Community-wide WiMAX networks require significant infrastructure, including: towers (number and placement determined by a site survey conducted by the installation company); antennas; WiMAX transmitters and receivers; management server; Internet backhaul; and power. A one-to-one laptop and WiMAX program would include network and hardware maintenance costs. WiMAX infrastructure is a capital expense that can be amortized over many years. The typical infrastructure costs $5-20 per student per month, over a five-year period, depending on factors such as population density, terrain, and the size of the area to be covered.

Benefits

1. Would offer up to 1 Gigabit of last mile wireless broadband access giving students the ability to download data intensive materials for their educational needs.
2. Working with both entities this could greatly benefit the Middle College program at APSU (Austin Peay State University) for more distance learning options.
3. Affordability. WiMAX is cheaper than DSL, cable, fiber to the home, and 3G wireless. This low cost per home brings it into the realm of possibilities for a school district to build its own private access network independent of commercial operators.
4. Empowers all students to access online educational material after school hours so that digital content is not restricted to school or library computer labs for low-income students who cannot afford laptops or Internet access at home.
5. Provides equal hardware and Internet access to all students.
6. Supports curriculum updates and increased push for STEM education.

Action Items

1. Develop partnership with area providers, technology and education organizations, local government, and school district.
2. Assess infrastructure needs.
3. Contact local or national WiMAX service and equipment providers.
4. Highlight areas to deploy Educational WiMax services offering 1 Gigabit of broadband access.

Status-Implementation Team

Planning stages, team to be developed from committee made up of IT professionals and representatives from APSU.

Middle Mile Access

Develop and Issue a Request for Proposal (RFP) for Build-Out

Goal

To identify the most credible and reliable broadband provider to serve your region's households and businesses.

Project Description

An RFP (request for proposals) is a widely used technique for establishing a selection of qualified responses from which to choose when contracting for services. The RFP should provide a guidance and due diligence framework for interested broadband providers and vendors. Furthermore, the RFP should request that interested parties provide plans for cost-effective community broadband networks, including equipment lists, locations, and itemized engineering cost estimates. In addition, the completed design should include what technology will be needed at customer premises, the performance that can be expected, and recurring costs associated with operating and maintaining the system once it is in place.

Benefits

1. After completing an RFP, your community will have a good handle on the potential project risks, as well as benefits, associated with build-out.
2. An RFP lets providers know that the situation will be competitive. The competitive bidding scenario is often the best method available for obtaining the best pricing and, if done correctly, the best value.

Action Items

1. Content: The RFP should include a project overview, background information, scope of work, and selection criteria. Additionally, the RFP should require that vendors provide a cover letter, a statement of project understanding, a business plan, a proposed project schedule, qualifications, references, and cost.
2. Distribution: Distribution can be accomplished in a variety of ways such as posting it to the community's website or sending out to a wide audience a one-page document announcing the availability of the full RFP with contact information for vendors and consultants who are interested in your project.

Develop Public-Private Partnerships to Deploy Broadband Service

Goal

Fund broadband network deployment

Project Description

Public-private partnerships take many forms, limited only by the imagination and legal framework in which the municipality operates. Some communities issue municipal bonds to fund construction of a network, which they lease to private carriers, with the lease payments covering the debt service. Others create non-profit organizations to develop networks in collaboration with private carriers or provide seed investment to jumpstart construction of networks that the private sector is unable to cost-justify on its own.

A public-private partnership should not be simply seen as a method of financing. The strength of these partnerships is that each party brings something important to the table that the other doesn't have or can't easily acquire. The community can offer infrastructure (publicly owned building rooftops, light poles, towers, and other vertical assets for mounting infrastructure) for the deployment of the system, as well as committed anchor tenants. Private-sector partners bring network-building and operations experience.

Benefits

1. The public sector transfers much of the risk for private investment. For example, the public sector has many funding tools available, including incentivizing continued investment through tax credits, encouraging greater availability of private capital through government guaranteed loans, or government being a direct source of capital through loans or grants.

2. The partnership can aggregate demand and reduce barriers to deployment. By working together, public and private parties can educate and build awareness needed for the public to better integrate the use of broadband into their lives, thereby improving the business case for broadband deployment.

3. A good partnership concentrates investment on non-duplicative networks and aims to ensure that all residents have access to adequate broadband service.

Action Items

1. Decide on the technology (e.g., cable, DSL, fiber, etc.).
2. Issue an RFP.
3. Develop a finance and ownership model.

Study and Possibly Reassess Major Telecom Purchase Contracts

Goal

Leverage the demand for broadband across community institutions to promote competition and investment in broadband services.

Project Description

Demand for broadband capacity across community institutions represents a key segment of the overall demand for broadband in many communities. The purchasing power of this collective should be leveraged to help promote greater competition in the broadband market and drive increased investment in backhaul and last mile broadband capacity.

Benefits

1. By aggregating demand within a local community, these institutions will be able to demonstrate to interested broadband providers existing pent-up demand and help justify private investments to bring greater capacity backhaul service to that community.
2. The increased backhaul capacity can in turn benefit the whole community.

Action Items

Develop partnerships between local high-capacity demand institutions, including local civic leaders, government entities, public safety agencies, libraries, hospital or clinics, and schools, in a coordinated effort to aggregate local demand needs for increased broadband capacity and service.

Mobile Broadband Availability

Improve Campus Connectivity

Goal

Ensure that all higher education campuses (especially community colleges) have adequate access to broadband networks.

Project Description
Improved access includes classroom access, better wireless coverage in common areas and student centers, as well as high-speed broadband access to student dorms. Before expanding access, a network assessment should be undertaken to ensure current coverage. Part of the expansion should include indirect requirements such as the potential need for increased tech support and power consumption due to increased usage of devices.

Benefits
Beyond the research and development tools, broadband enables higher education institutions to offer college credit for online courses for advanced high school students; offer specialized science and technology online learning experiences in subjects where there are too few specialized K-12 teachers; support adult students through personalized career and technical programs while working around the needs of their jobs and families; and extend continuing education programs by offering diverse, quality content to the public to foster job skills, community development, and personal growth.

Action Items
1. Utilize the national broadband availability map and assess your community's needs. The U.S. Department of Education developed this broadband availability map and search engine as part of a collaborative effort with the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC). This education-focused broadband map and database build upon the NTIA State Broadband Initiative (SBI) Program that surveyed bi-annually broadband availability and connectivity for the 50 United States, 5 territories, and the District of Columbia.
2. Research federal and state funding sources.

Complete a Vertical Assets Inventory

Goal
Develop a single repository of vertical assets, such as communications towers, water tanks, and other structures potentially useful for the support of deploying affordable, reliable wireless broadband in less populated rural areas or topographically challenged areas.

Project Description
Wireless communications equipment can be placed in a wide variety of locations, but ideally, wireless providers look for locations or structures in stable conditions, with reasonably easy access to electricity and wired telecommunications, and with a significant height relative to the surrounding area. "Vertical assets" are defined as structures on which wireless broadband equipment can be mounted and positioned to broadcast a signal over as much terrain as possible. These assets include structures such as cell towers, water tanks, grain silos, and multi-story buildings.

The lack of easily accessible and readily usable information regarding the number and location of vertical assets prevents the expansion of affordable, reliable wireless broadband service. Wireless broadband providers must determine if it is worth the effort and expense to collect and analyze this data when making investment decisions. Public sector organizations are faced with the same challenges. A centralized and comprehensive vertical assets inventory can help wireless broadband providers expedite decisions regarding the deployment of affordable, reliable broadband service in rural areas.

Benefits

1. The vertical assets inventory provides data for private and public investment decisions, lowering the initial cost of efforts needed to identify potential mounting locations for infrastructure.

2. The inventory can encourage the expansion of affordable, reliable wireless broadband services to underserved areas by shortening project development time.

Action Items

1. Identify or develop a vertical assets inventory toolkit to provide guidelines to identify structures or land that could serve as a site for installation of wireless communications equipment.
2. Data to collect would include vertical asset type, owner type, minimum base elevation, minimum height above ground, and location.
3. Identify and map elevated structures utilizing your community's GIS resources. The resulting database should be open-ended; localities should be encouraged to continuously map assets as they are made available.

Identify and Expand Wireless Hotspots in the Community (community personalized)

Goal

Expand free broadband wireless access within the community.

Project Description

To work with community partners to develop a network of expanded wireless hotspots throughout the community to allow for greater access to broadband for work, education, entertainment, and quality of life. Primary focus would be in parks and downtown initially with research to determine other access areas that show a need or demand. The plan looks to utilize wireless kiosks that not only provide wireless broadband access but can provide information via a touch screen about local businesses, visitor information, and access to other government sites for business in the community.

Benefits

- Expanded access to broadband services for citizens for work, education, convenience and entertainment
- Economic development plus as a quality of life initiative for the community in recruitment of industry and business
- Tourism benefit as visitors will have greater access to wireless broadband while enjoying the amenities offered in the community

Action Items

1. Develop a community Wi-Fi inventory.
2. Conduct an analysis to identify key areas and organizations for the expansion of local wireless hotspots.
3. The local Chamber of Commerce and tourism groups should promote the hotspots to ensure maximum visibility in the community.

Status-Implementation Team

Pending with testing phase planned for later this summer, Implementation team consists of CDE Lightband staff, City of Clarksville IT staff, and Two Rivers Company Director.

ADOPTION

Digital Literacy

Distribute Digital Literacy Content

Goal

Facilitate partnerships in order to provide digital literacy training.

Project Description

Leverage the abundant digital literacy content available online to distribute to local trainers. Currently, numerous non-profit organizations and for-profit corporations provide curriculum that can be adapted for classroom or self-paced study. Some organizations also provide additional resources for instructor use, including classroom setup information, teaching tips for each course, additional practice, test item files, and answers to frequently asked questions. Digital literacy content can be deployed via local websites (a community portal), print material, podcasts, blogs, and videos.

Additionally, your community could create a partnership between libraries, school systems, computer suppliers, and broadband providers to provide free training and discounted computers and broadband service to low-income community members who are not participating in the digital age. An example of such a program is Connected Nation's Every Community Online program. This is an innovative program that is providing free digital literacy training, access to low-cost computers, and discounted broadband access to communities across the country.

Benefits

Increasing the community's digital literacy facilitates widespread online access to education and other public and government services, provides equal access to opportunities such as jobs and workforce training, enables people to find information about their health, and offers the opportunity to increase levels of social interaction and civic involvement.

Action Items

1. Develop partnerships with local organizations and equip them with digital literacy content
2. Train staff to deliver the curriculum to potential adopters
3. Promote local organizations as a source of broadband access and training
4. Engage non-adopters with a comprehensive public outreach campaign, helping them understand the benefits of broadband service and inviting them to experience the value at their libraries
5. Provide curriculum to teach computer and Internet use, as well as the skills required to utilize the Internet effectively for essential services, education, employment, civic engagement, and cultural participation
6. Offer compelling promotion to participants, giving them the opportunity to adopt the technology for everyday use in their homes

Facilitate Internet Safety Classes (community personalized)

Goal

Work with local entities to facilitate Internet Safety programs for a greater understanding of the implications of putting personal information online and how to protect your information. .

Project Description

Develop a plan to work toward providing Internet safety education through seminars and programs via the library, school system, senior centers, and civic groups. Partner with local government entities, Internet service providers, and other technology specialists to develop a speaker's bureau to address the program needs. This program is designed to help community members who are using the Internet to identify and avoid situations that could threaten their safety, threaten business or government networks, compromise confidential information, compromise the safety of children, compromise their identities and financial information, or destroy their reputations.

Benefits

1. Gives residents of all categories the access to Internet safety education but primary focus will be on seniors and teens. These groups are more susceptible lack of awareness regarding of the implications of posting or putting any personal information online.
2. Builds a group of "aware" citizens that will lessen the exposure of the community to cyber attacks.
3. Creates a group of technology experts to speak at various venues, spreads out the responsibility, and also provides a medium for these experts to collaborate and build relationships

Action Items

1. Partner with a local library or community center to offer security awareness training initiatives that include classroom style training sessions and security awareness websites and information booklets.
2. Awareness training can also be used to alleviate anxiety for community members who are not using the Internet because of fear of cyber threats.

Status – Implementation Team

Pending for summer launch, the team comprised of Assistant Director of the CMC Public Library and IT professionals in the community will implement.

Develop a Technology Mentorship Program

Goal

Utilize student technology knowledge to implement community programs.

Project Description

Initiate a program designed to recruit local high school or college students who excel in school and exhibit advanced leadership and technology skills to assist in technology training, technical support, and outreach efforts in their communities. Recognizing students as a powerful resource for local outreach efforts, the program will tap into the technology knowledge base that exists among students and will challenge students to extend their teaching and learning experiences beyond the classroom.

Benefits

1. The program helps students develop self-confidence and technical competencies as they work with their families, leaders, peers, neighbors, seniors, and other members of their communities. In addition to empowering these students with real world experience, it helps enhance their skills as they mature into productive and highly competent citizens.
2. It helps to build character by awarding students opportunities to give back to their communities and embrace responsibilities associated with community service.

3. The program will engage students who are creative, knowledgeable, and interested in technology as a great resource for planning, implementation, support, and using technology at a local level. With guidance and support, they will help to provide a missing, and important, link between the members of the community who have experience with broadband technology and those who are currently not using it.
4. The program will expose students to potential career paths and provide a basis to determine if they want to further their educations in a technology field. It could also potentially provide a beginning client base from the relationships he or she has built within the community as a student.

Action Items

1. Identify the program format and offerings. Similar technology mentorship program are organized as student-run help desks or student-led classes.
2. The program can be hosted at a local school or community anchor institution such as a library or community center, and could be run during the school day as part of the regular curriculum, during study hall or as an afterschool activity.
3. The curriculum could be borrowed from an existing technology mentorship program, or could be student-driven. Similar programs offer digital literacy training to seniors, provide computer refurbishing, build websites, and other forms of tech support to local residents.

Establish a "Community Technology Academy" (community personalized)

Goal

Work with the Tennessee Technology Center and other educational sources to establish a Technology Academy providing for more technology education resources. Create a partnership to underscore a community's commitment to developing a tech-savvy workforce.

Project Description

Develop the educational emphasis needed on technology education to enhance skill sets, career development, and economic development opportunities, by offering stronger options for specialized technology training.

Benefits

1. Expand on the current offerings in technology training in the area to include fiber splicing/management certification.
2. Offer a program that will extend the current STEM program in the public schools' Gaming Academy to offer options for a full Internet coding/programming school
3. Will provide better opportunities for job placement for citizens.
4. Offers a ready workforce for economic development in the technology sector.
5. Creates a more digitally literate and competent populace.
6. Develops community's human capital.

Action Items

1. Identify all organizations performing technology education and training services.
2. Identify all the organizations that have computer labs.
3. Compile a list of classes to be offered and develop content or leverage content that is currently available at minimum or no cost from organizations such as Microsoft.
4. Determine what classes are currently being offered in the community.
5. Develop a collaborative and cooperative approach for operating the "Community Technology Academy" among all organizations.

Status - Implementation Team

Preliminary discussions underway, team will be comprised of IDB representatives, Tennessee Technology Center staff, and fiber and IT professionals in the community.

Public Computer Centers

Initiate a Community Computer Refurbishment or Recycling Program

Goal

Initiate a computer refurbishment program designed to help recycle computers donated by local businesses, government, schools, and other organizations, and then distribute them to low-income households and other households who face affordability barriers to computer ownership. Alternatively, develop a community recycling program to reduce the amount of hazardous materials that may enter the environment.

Project Description

Recruit community members to sanitize old computers and install new software. There are several target groups for performing refurbishments: community volunteers, high school and college students, and prison inmates. Community computer refurbishing provides an opportunity for volunteers and students to gain valuable new skills and training that can be used for career enhancement, and in some cases earn credits for high school or college, while reinvesting in their communities. Communities also have the option of using prison inmates to refurbish computers so that they leave prison with valuable job skills. Alternatively, if the computers are beyond refurbishment, the community can develop a computer recycling program. Recycling and reusing electronic equipment reduces the amount of hazardous materials that may enter the environment. Recycling and reuse programs also reduce the quantities of electronic scrap being landfilled in the state.

Benefits

1. Computer refurbishing programs have proven to be an excellent workforce training tool for correctional facilities, young adults, and the mentally and physically challenged. The

correctional facility program trains inmates with computer skills that should help them find jobs upon their release.

2. Demanufacturing (the process by which computers and other electronic equipment are refurbished or broken down to their basic parts) helps conserve energy and raw materials needed to manufacture new computers and electronic equipment. These parts are then reused in upgrading other computers.

Action Items

1. Develop a model for computer refurbishing or recycling. A basic framework might include:
    a. Step 1: Project Planning
        i. Determination of minimum computer specifications
        ii. Acquisition and storage of donated computers
        iii. Determination and installation of appropriate computer operating system
        iv. Calculation of costs needed to carry out the program
    b. Step 2: Inventory Management
        i. Examine how equipment and software will be sorted and managed; manage inventory by identifying computers that are ready to be refurbished from those that are non-functioning
    c. Step 3: Volunteer Training
        i. Review established residential refurbishment and recycling programs that the community can take advantage of:
            1. Dell's Reconnect program is a residential computer recycling program that offers a convenient way to recycle used computer equipment. Drop off any brand of used equipment at participating Goodwill donation centers in your area. It's free, and participants receive a receipt for tax purposes. To view a full list of acceptable products and locations, visit the Dell Reconnect website.
            2. Earth 911 Earth 911 is a comprehensive communication medium for the environment. Earth 911 has taken environmental hotlines, websites, and other information sources nationwide and consolidated them into one network which can be searched for community-specific information.
            3. E-Cycling Central The Telecommunication Industry Association's E-Cycling Central website helps you find reuse, recycling, and donation programs for electronics products in your state.

Procure a Multipurpose Mobile Technology Center

Goal
Provide unserved and underserved residents with computer and Internet access.

Project Description
Partner with the public library or school system to acquire a bus (or equip a bookmobile) with laptop computers and wireless Internet service to deliver technology access and programs to unserved residents in remote areas in the community. Equipped with an instructor, the mobile technology center should provide digital literacy classes, job search assistance, e-learning programs, information during community events, and emergency assistance. Beyond training and education, the mobile technology center should be utilized to target and reach unserved or underserved members of the community and to provide them a medium for participating in the community's technology planning process.

Examples of existing mobile technology centers include:
St. Louis Community College Mobile Tech Center
El Paso Public Library Tech-Mobile
State Library of Ohio Mobile Technology Training Center
Pike County Public Library District Mobile Technology Center

Benefits
1. Improves digital literacy skills of community.
2. Provides outreach and awareness.
3. Provides opportunity for residents to participate in community's technology planning process.

Action items
Equip the vehicle with:
1. 10-20 laptops loaded with appropriate software.
2. A wireless modem that interfaces with a wireless relay station on the vehicle. Signals can be sent from any remote site in the community to partnering organization (e.g., public library) for deployment to the Web, television, or other medium.
3. Large screen TV.
4. Smart board for instruction.
5. Wheelchair accessible workstations.
6. Networked printer.
7. Full-time instructor(s).
8. Develop schedule of mobile technology center visits.

Provide Incentives to Encourage Computer Purchases Among Students

Goal

Look to local public/private partnerships to initiate more access to computers in the home for disadvantaged students and provide Internet access to these students as well. Provide equal access to computers and enable digital learning.

Project Description

Expand on developed partnerships with city and county government leaders, private Internet providers, grant funds, and other resources to identify ways to get computers/tablets into the hands of students who do not currently have the ability to work online as part of their education. Further, look at an opportunity to provide free/reduced Internet access that is subsidized by the government entities and the private sector to students who qualify for free/reduced lunch programs in the school.

Benefits

1. Provides access to more educational resources to students that don't have that access today
2. Provides for a link from the teachers to the students outside of school to further enhance the teaching/learning process
3. Levels the playing field for students from all economic and resource backgrounds with regard to access to education and support
4. Provides equal computer access, regardless of ability to purchase.
5. Supports school-wide online education initiatives.
6. Enables the adoption of e-books.

Action Items

1. Research grants and private funding opportunities.
2. Assess whether developing a leasing or purchasing program is more appropriate for your school.

Status – Implementation Team

Idea development stage, team would need to be comprised of public entities with city, county, and school system governments and private stake holders in the community.

Broadband Awareness

Implement a Community-Based Technology Awareness Program

Goal
Organize, promote, and deliver a technology awareness program that would increase utilization of technology resources in the community.

Project Description
Conduct an extensive advertising campaign to raise awareness about the benefits of broadband and related technology. Develop a strategy to help the community become more aware of the benefits associated with computers and Internet adoption in their daily lives and activities. Methods of delivery include, but are not limited to, classroom style awareness sessions, press conferences led by community leaders, hosting a speaker at a community event, posting community posters and handouts, and public service announcements.

Additionally, the campaign should specifically target technology non-adopters. By using established media, the campaign reaches non-adopters where they are. Public radio, broadcast and cable TV, utility bill stuffers, and print newspapers have been utilized to reach households of many types. The public awareness campaign should focus on helping residents, particularly those from underserved communities, understand the personal value they can derive from an investment in information technology.

There are also opportunities to leverage existing resources to expand and enhance workforce-training programs, encourage more post-secondary education, and create additional awareness within the community in regard to global resources. It is important to support the outcomes of awareness training with the development of technology training programs that will then teach community members how to use the technology.

Benefits
Success is achieved when a community experiences increased usage of computers and the Internet, improved basic computer skills, increased use of technology in day-to-day operations of a community, and increased access to economic opportunities.

Action Items
1. Determine the type of public awareness campaign that is appropriate for your community. Connect Ohio's statewide Every Citizen Online public awareness campaign provides an excellent case study of a professionally developed campaign. http://connectohio.org/public-awareness-campaigns
2. Create a centralized technology portal/website that promotes local technology resources for use by residents. Resources would include calendars (promoting local tech events and showing available hours at public computer centers), online training resources, and local computer resources.

Facilitate a Technology Summit

Goal

A technology summit should bring together community stakeholders to develop a dialogue about how public and private stakeholders can collectively improve broadband access, adoption, and use.

Project Description

Develop and host a technology summit for residents and businesses to increase awareness of broadband value, service options, and the potential impact on quality of life. The technology summit should facilitate community partnerships between leaders in local government and the private sector, including non-profits and private businesses in the education, healthcare, and agriculture sectors, with the goal of ensuring that residents have at least one place in the community to use powerful new broadband technologies, and that this asset will be sustained over time. Further, the technology summit should highlight success stories as evidence of the impact of technology.

Benefits

1. Highlights successes, opportunities, and challenges regarding community technology planning.
2. Develops ongoing dialogue around improving broadband access, adoption, and use.
3. Unifies community stakeholders under one vision.

Action Items

1. Create community partnerships.
2. Identify funding sources and hosts.
3. Identify suitable speakers.
4. Develop relevant content.

Improve Campus Connectivity

Goal

Look at ensuring that all educational sources are connected seamlessly via the Internet for a more collaborative approach to education.

Project Description

Establish a technology group representing public and private schools, university, community colleges, and technology center to ensure connectivity via fiber/point-to-point connections and adequate bandwidth access for the sharing of educational materials, data, student learning profiles, distance learning and more.

Benefits

1. Access to greater educational resources without the limitations of bandwidth or direct access
2. Levels the playing field for all students without regard for where their primary education opportunity resides. A private school student and a public school student could access important research available at the University without being hindered by direct access by using the Internet to gain the access needed.
3. Provides opportunities for educators at the University level to offer lectures and expansion on a particular topic via distance learning in real time to the local public and private

Action Items

1. Utilize the national broadband availability map and assess your community's needs. The U.S. Department of Education developed this broadband availability map and search engine as part of a collaborative effort with the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC). This education-focused broadband map and database build upon the NTIA State Broadband Initiative (SBI) Program that surveyed bi-annually broadband availability and connectivity for the 50 United States, 5 territories, and the District of Columbia.
2. Research federal and state funding sources.

Implementation Team

Idea development stage, team would need to be comprised of education stakeholders from the public and private schools and the university/college areas to discuss how best to maximize the resources using the connectivity they have.

USE

Economic Opportunity

Create a Main Street Portal (Community Portal)

Goal

Collaborate with local businesses, government, schools, non-profits, and community volunteers to create a web portal that will serve as a one-stop shop for all online government services, community resources, tourism and economic development, census information, news, and events.

Project Description

A community portal can be hosted by a local government, a non-profit, school, or an individual, depending on the preference of the community and availability of resources. Some of the major requirements of the portal include a good content management system, simple yet flexible interface, and interactive tools. A feature-rich community portal with multiple ways to inform community members about what is happening the community (e.g., community calendar, discussion forums, voting polls, blog community, real time chat, videos and image gallery, RSS feeds, blogs, automated reminders, accompanying Apps for smartphones, etc.) has the potential to increase civic participation.

The portal has a dual purpose. One purpose is to inform residents and businesses within the community about community events and initiatives, groups, and economic development initiatives. Additionally, the community portal can act as a training and education resource for residents; short courses and webinars can be offered on topics of interest in the community (e.g., education on community-wide economic development or infrastructure initiatives, pollution mitigation, community gardening, local zoning laws, etc.)

Secondly, a community portal empowers others from outside of the community to learn more about the community itself. A community portal helps project an image of a dynamic and "connected" community that has a savvy, tech-ready workforce and an informed citizenry. Businesses want to move to communities that are comfortable with technology and that are clearly making modest investments to stay current. As a marketing tool, the community portal becomes an important part of tourism efforts, a way to get travelers and visitors to stop and spend money on lodging and meals, to market local businesses to customers outside the community, and to project a modern and exciting image to the world. For a community to be seen as vibrant, attractive, and great place to live and to work, the portal must be of the highest quality to project that image.

Benefits

1. Drives web traffic to other community links.
2. Available and open data increases informed decision making and participation.
3. Increases the community's visibility on the web.
4. Acts as a recruitment tool for knowledge workers and high-tech businesses.
5. Assists community members and visitors in making informed decisions.
6. Can become a key tourism tool.

Action Items

1. Identify a host for the portal. The host can be a local government, non-profit, school, or an individual, depending on the preference of the community and availability of resources.
2. Some of the major requirements of the portal include a good content management system, simple yet flexible interface, and interactive tools.
3. The community portal should be continually updated to reflect the community's needs and technological expertise.

Develop a Farmers Network

Goal

Create a portal to keep the agricultural community connected and to facilitate advanced information sharing, news, and marketing of products.

Project Description

Create a local agricultural portal to connect farmers with buyers and agricultural technical experts such as the United States Department of Agriculture (USDA), researchers, university and extension offices, state department of agriculture, the State or National Farm Bureau. This portal will enable local farmers to share the latest techniques in farming such as using technological tools and data to make decisions. Tools can include GPS, yield monitors, variable rate technology, and remote sensing. Farmers can also share how to be successful in maximizing production and reducing costs.

Beyond information sharing, a local agricultural portal could also be utilized to provide online "booth space" for growers, producers, and artisans selling directly to the consumer. Set up much like an open-air farmers market where vendors offer food, crafts, gifts, supplies, garden tools and more, the purpose would be to provide a space where local and regional consumers can meet, converse, and purchase products directly from the farm. This online farmers market could be a feature in the local agricultural portal or a Main Street Portal. Either way, an online farmers market should be feature-rich, enabling virtual farm tours, discussion forums, video and image galleries, and real-time ordering and payment.

Benefits

1. Connects agricultural community.
2. Connects agricultural producers and consumers.
3. Facilitates knowledge-share.
4. Could be used for e-commerce.

Action Items

1. Identify an appropriate host for the agricultural portal.
2. Some of the major requirements of the portal include a good content management system, simple yet flexible interface, and interactive tools.

3. The community portal should be continually updated to reflect the agricultural community's needs and technological expertise.

Develop a Tourism Portal

Goal

Create a tourism portal that informs tourists about local attractions and provides information to locals regarding current activities, groups, and commerce.

Project Description

Creating a tourism portal is a way to market local attractions to travelers from around the world and deliver sophisticated, interactive multimedia tools that detail lodging, recreation, and amenities in the community. Visitors to the portal must also be able to register for events, make reservations, and have access to activities, businesses, and other items that tourists generally look for such as locations of ATM machines, restaurants, antique bazaars, museums, hotspots, and tourist agencies. The tourism portal can be a component of a comprehensive community portal that has a dual purpose: first, to inform tourists about local attractions and give them opportunities to make inquiries and reservations; second, to inform local residents and businesses within the community about current activities, groups, and commerce. In addition to serving residents, the portal will help to inform residents and businesses within the community about current activities, groups, and commerce.

Benefits

1. Informs tourists and advertises to potential tourists.
2. Drives web traffic to local businesses and tourist attractions.
3. Increases the community's visibility on the web.

Action Items

1. Identify an appropriate host for the tourism portal.
2. Some of the major requirements of the portal include a good content management system, simple yet flexible interface, and interactive tools.

Online Identification of Broadband Services at Key Economic Sites

Goal

Develop an inventory of the broadband and telecommunication services available at community industrial parks, business parks, and other key business locations to share with regional and state economic development planners.

Project Description
Research and gather an inventory of the broadband and telecommunication services available at community industrial parks, business parks, and other key business locations. Gathered information could include the highest speeds, technology platform, and number of fiber providers available. If not available, the closest provider and distance should be identified. All information should be shared with regional and state economic development planners, as well as listed on the area economic development websites (e.g., Chamber of Commerce or Area Development Districts).

Benefits
This data can be utilized to make site selection decisions, as well as to attract potential investment. According to a 2011 survey of building owners and property managers, broadband access is one of the most important decision factors for commercial real estate siting – after price, parking, and location. Similarly, a national survey found that 77 percent of economic development professionals believe that to attract a new business, a community must have broadband speeds of at least 100 Mbps.

Action items
Collaborate with commercial building owners, providers, and other stakeholders to develop an inventory of broadband and telecommunications services available at key economic sites.

Host Website and Social Media Classes for Local Businesses

Goal
To encourage small local businesses to develop websites and to use social media and e-commerce.

Project Description
For small businesses, an online presence and the use of social media are vital to stay competitive in the twenty-first century. A website and social media are not just for companies that have the experience, staff, or budget; any small business can tap into these resources. Training should be provided to small businesses regarding the use of websites and social media within that small business. Website topics should range from starting a basic website to more advanced topics such as e-commerce. Social media topics should include a variety of social media outlets including Facebook, Twitter, YouTube, Pinterest, and LinkedIn.

Benefits

- Provides entrepreneurial support.
- Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
- Promotes business growth and workforce development.
- Broadband empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to

customers, suppliers, and new markets. According to Connected Nation's 2012 Jobs and Broadband Report, businesses that are using the Internet bring in approximately $300,000 more in median annual revenues than their unconnected counterparts.
- Provides marketing information on current Internet trends, the importance and influence of customer review sites as well as e-mail marketing tips.
- Assist in accelerating business development and provide opportunities for innovation, expansion, and e-commerce through broadband.
- How to use enhanced social media and visuals to engage your audience.
- How to explore the power of social networking and how to leverage the various social media platforms to gain more sales and build customer loyalty.
- How to deal with the growing trend of hand-held smartphones and how to have a presence on these devices, designing for mobile, mobile trends, consumer interaction, branding on mobile, and QR Codes.

Action Items

1. Work with the local Chamber of Commerce and/or the libraries to expand on existing programs that promote e-commerce, such as free websites and social media development, within the small businesses of the community including those involved in agriculture.
2. Partner with providers to sponsor workshops. (Providers may be willing to sponsor events since small business workshops will likely lead to increases broadband adoption and use).
3. Identify regional and community partners with resources and expertise to assist the community in producing "free" website and social media workshops.
4. Schedule workshops and advertise classes via local media.

Create a Telework Support and Attraction Program

Goal

Promote or develop flexible efficient and effective work arrangements.

Project Description

Teleworking offers significant benefits to employers, employees, self-employed individuals, and entrepreneurs. These benefits include businesses infrastructure savings, emissions reduction, and congestion management. Further, teleworking can help businesses and government agencies reduce real estate, energy, and other overhead costs, using the savings to avoid job cuts or to hire new staff. Research has shown that teleworking programs can increase an employer's productivity and enable them to continue operating without skipping a beat in the face of a natural disaster or other emergency situation that might otherwise bring business to a halt. Teleworking also allows employees to lower their commuting costs while juggling both work and family, even accommodating people with disabilities, the elderly, working mothers, and rural residents who may not be in a position to work outside the home.

It is unlikely that all employees will be able to telework. A good way to start is to identify types of positions or job types that can be performed remotely. Before fully implementing the policy, initiate a trial period and track results. Get feedback from managers and other employees as to the benefits and any challenges they are seeing. Then fine-tune and possibly expand the program to best suit everyone's needs.

Benefits

1. Teleworking can benefit the environment, boost economic growth, and provide a better work-life balance for employees.
2. Taps into community's workforce potential (employable individuals with transportation limitations).
3. Makes community more attractive to knowledge workers and business expansion.

Action Items

1. Promote the establishment of a teleworking pilot program.
2. Establish a cross-functional project team, including, for example, information technology labor representatives and other stakeholders.
3. Establish an agency-wide telework policy.
4. Establish eligibility criteria to ensure that teleworkers are selected on an equitable basis using criteria such as suitability of tasks and employee performance.
5. Develop a telework agreement for use between teleworkers and their managers.
6. Conduct assessment of teleworker and organization technology needs.

Develop or Identify a Broadband Training and Awareness Program for Small and Medium Businesses

Goal

Businesses adopt and use broadband-enabled applications, resulting in increased efficiency, improved market access, reduced costs, and increased speed of both transactions and interactions.

Project Description

Methods of implementing a small and medium business broadband awareness program include, but are not limited to, facilitating awareness sessions, holding press conferences led by community leaders, inviting speakers to community business conferences or summits, and releasing public service announcements. It is also important to educate local businesses about Internet tools that are available at minimum or no cost to them.

A training program, or entry-level "Broadband 101" course, could be utilized to give small and medium businesses an introduction on how to capitalize on broadband connectivity, as well as more advanced applications for IT staff. In addition, training should include resources for non-IT

staff, such as how to use commerce tools for sales, streamline finances with online records, or leverage knowledge management across an organization. Additional training might include:

- "How-to" training for key activities such as online collaboration, search optimization, cybersecurity, equipment use, and Web 2.0 tools.
- Technical and professional support for hardware, software, and business operations.
- Licenses for business applications such as document creation, antivirus and security software, and online audio and videoconferencing.

- Website development and registration.
- Basic communications equipment, such as low-cost personal computers and wireless routers.

Benefits

1. Provides entrepreneurial support.
2. Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
3. Promotes business growth and workforce development. Broadband empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets. According to Connected Nation's 2014 Business Technology Assessment, online sales represented $2.3 trillion in sales revenues for U.S. businesses in 2013.

Action Items

1. Identify federally or state sponsored business support programs (e.g., Chamber of Commerce, SBA, EDA, Agriculture, or Manufacturing extension) that include assistance with broadband or IT content.
2. Identify or develop a business awareness and training program.
3. Identify or develop online training modules for businesses. For example, the Southern Rural Development Center, in partnership with National Institute of Food and Agriculture, USDA, administers the National E-Commerce Extension Initiative. As the sole outlet nationally for e-commerce educational offerings geared at Extension programming, the National E-Commerce Extension Initiative features interactive online learning modules. In addition, the program's website offers a library of additional resources and a tutorials section for greater explanation on website design and function. Modules and presentations include: A Beginner's Guide to E-Commerce, Doing Business in the Cloud, Electronic Retailing: Selling on the Internet, Helping Artisans Reach Global Markets, and Mobile E-Commerce. To see some examples, click here: http://srdc.msstate.edu/ebeat/small_business.html#.

Create Local Jobs Via Teleworking Opportunities

Goal
Connect IT training and education with remote employment opportunities.

Project Description
Connected Nation's Digital Works program is a hybrid between an employment agency and a co-working facility that connects residents with online training courses and connections with companies that lack a physical presence in the community. The Digital Works program creates jobs in areas facing high unemployment by leveraging broadband technology for call center and IT outsourcing. Extended training is available for HTML programming and other technical positions as well. The program is providing an avenue for communities to create a job incubator, retaining workers in the area and attracting corporate jobs while providing a pathway for improving a worker's competitive advantage in the twenty-first century workforce with specified coursework and training.

At the end of training, workers are placed in available positions that match their skills and interests. All jobs pay above minimum wage and the training provides opportunities for placement at levels for upward mobility. This is work that can be done from home or at the Digital Works center, which is provided through a partnership with the community.

Benefits
This type of project can educate, train, employ, and has the potential to ultimately increase the productivity and economic competitiveness of your community's workforce.

The physical infrastructure and training exposes a broad spectrum of residents to the benefits of telecommunications and productive uses of the Internet.

Through training and work, participants will rely heavily on local ISPs, broadband technology, and emerging IT technologies to provide services to a global marketplace, in turn fostering the demand-driven strengthening of the community's physical Internet infrastructure.

Action Items

1. The Digital Works program requires a site suitable for establishing office infrastructure, educational partners to develop the workforce, and business relationships with enterprises willing to hire workers through the digital factory.
2. Identify the physical, financial, and technological resources needed to establish a digital factory.
3. Space to house workspace and training and support offices will be needed, as well as the equipment, such as computers and monitors for videoconferencing and training.
4. Develop partnerships with companies who would provide contractual employment to program graduates.
5. Visit http://www.digitalworksjobs.com/ to learn more.

Education

Develop Technology Working Groups

Goal
Address the community's technology-related problems, assets, and opportunities.

Project Description
Starting with a detailed assessment of technology usage within the community's education sector, develop technical working groups of educators, researchers, and local policymakers to address the community's technology problems, assets, and opportunities. Topics to focus on could include digital literacy, training of teachers, development of online curriculum, computer and broadband availability to students and faculty, broadband availability at student homes, or technology-driven classrooms. Input gathered from the working groups should be utilized to develop a strategic education technology plan.

Benefits
1. Promotes collaborative environment to address educational technology planning.
2. Enables K-12 system to prepare for and benefit from new technologies.
3. Empowers K-12 system to better utilize fiscal resources.

Action Items
1. Assess education sector's technology usage. Analyze problems, assets, and opportunities.
2. Present input to technical working groups who will craft recommendations for an education technology plan.

Offer Professional Development Programs for Teachers on Classroom Applications

Goal
Ensure that educators have the skills needed to integrate technology into the classroom.

Project Description
Provide professional development and opportunities for staff to gain skill in integrating technology into all content areas and utilizing technology for instruction. To ensure proper training is being offered, technology standards should be created to guide professional development and should provide guidance on strategies and content appropriate for developing skills and proficiency in utilizing instructional technology at all levels. Instruction starts with keyboarding and online academic resources beginning in primary levels through increasing complex skill development and projects and research through graduation.

In addition, school administrators should be encouraged to provide support for the development of a web-based professional development and administrative support program for educators. eTech Ohio, for example, "serves as a one-stop shop for providing planning, support, and information about grants, subsidies, and professional development, as well as teaching, learning, and technology integration." The program also supplies resources for administrators and technology support staff.

Benefits

1. Encourages hesitant teachers to use technology in the classroom.
2. Enables educators to update curriculum to reflect technology integration.

Action items

1. Develop technology standards and guide professional development.
2. Encourage teachers and school districts to create clear visions of what an ideal classroom with integrated technology looks like. Individual teachers can design their own technology growth development plans by outlining their expectations for the school year.
3. Build an on-campus and/or online professional learning network.
4. Funding for professional development could be strategically allocated to encourage experimentation with supportive technologies in addition to, or perhaps in lieu of, more traditional onsite assistance. Conversely, the school district could invest in a full-time "technology facilitator" who provides teachers with convenient solutions to technical queries.

Improve Education Through Digital Learning

Goal

Increase student attention and engagement; encourage students to take ownership of their learning and make it easier for teachers to differentiate instruction without embarrassing students.

Project Description

Several digital learning platforms are available for K-12 implementation. For example, CFY is a national education nonprofit that helps students in low-income communities, together with their teachers and families, harness the power of digital learning to improve educational outcomes. The organization is unique in that it operates both "in the cloud" (through PowerMyLearning.com, a free K-12 online learning platform) and "on the ground" (through its Digital Learning Program, a whole school initiative that works hands-on with all three of the constituents that impact student achievement: teachers, parents, and students).

PowerMyLearning.com is a free online educational tool that helps students, teachers and parents locate and access over 1,000 high-quality online digital learning activities – videos, simulations, and other educational software – to propel student achievement in subjects

including math, English, science, and social studies. The platform features a kid-friendly design. There is a playpoint/badge feature to help motivate students. In addition, students can rate digital learning activities and share them with friends via e-mail, Facebook, and Twitter. CFY also provides onsite training to instruct teachers how to integrate PowerMyLearning into their classrooms.

Benefits

1. Increase learning time by extending learning beyond the classroom walls.
2. Individualize learning and increase student engagement in school.
3. Encourage self-directed learning.
4. Enable parents to more effectively support their children at home.

Action Items

1. Launch a program to promote digital education via newsletter and social media to all the residents within the school districts. Many of the successful school districts launched this digital education program two years prior to their request of a technology bond issue that would support a digital learning program.
2. Coordinate this effort with the local libraries which will need to adjust their services to support this program.

Connect All School Classrooms to the Internet

Goal

Facilitate the connection of all classrooms to broadband Internet so that teachers and students can take advantage of global educational resources.

Project Description

A K-12 broadband network should provide adequate performance and reach, including abundant wireless coverage in and out of school buildings. "Adequate" means enough bandwidth to support simultaneous use by all students and educators anywhere in the building and the surrounding campus to routinely use the Web, multimedia, and collaboration software. To reach the goal of sufficient broadband access for enhanced K-12 teaching and learning and improved school operations, the State Educational Technology Directors Association (SETDA) recommends that broadband speeds in schools should equate to a minimum of 100 Kbps per student/staff. However, given that bandwidth availability determines which online content, applications, and functionality students and educators will be able to use effectively in the classroom, additional bandwidth will be required in many, if not most, K-12 districts in the coming years.

In order to evolve with technology, school districts must continue to update local educational policies and curriculum, assess their broadband and classroom technology needs, evaluate the professional development requirements of teachers, and provide tech support.

Benefits

1. Students can actively utilize school computers to access rich, multimedia-enhanced educational content and the Internet.
2. Students can post their content (including audio and video podcasts) to school learning management systems, access their e-textbooks and get their assignments online, and collaborate daily across the network with other students via wikis and other Internet-based applications.
3. Teachers can videoconference or download streaming media to classrooms and take their students on virtual field trips to interact with subject area experts.
4. School systems can utilize online courses.
5. Teachers can actively participate in online professional learning communities to share lessons and to participate in professional development.

Action Items

1. Assess current and future bandwidth needs.
2. Utilize E-Rate funding. E-Rate is the commonly used name for the Schools and Libraries Program of the Universal Service Fund, which is administered by the Universal Service Administrative Company (USAC) under the direction of the Federal Communications Commission (FCC). The program provides discounts to assist most schools and libraries to obtain affordable telecommunications and Internet access. Funding is requested under four categories of service: telecommunications services, Internet access, internal connections, and basic maintenance of internal connections. Discounts for support depend on the level of poverty and the urban/rural status of the population served and range from 20% to 90% of the costs of eligible services. Eligible schools, school districts, and libraries may apply individually or as part of a consortium.
3. If broadband capacity is lacking at the local level, seek partnerships with other local high-capacity demand institutions, including local civic leaders, government entities, public safety agencies, libraries, and hospitals or clinics, in a coordinated effort to aggregate local demand needs for increased broadband capacity and service. By aggregating demand within a local community, these institutions will be able to demonstrate to interested broadband providers existing pent-up demand and help justify private investments to bring greater capacity backhaul service to that community. That increased backhaul capacity can in turn benefit the entire community.

Improve Educational Technology Hardware

Goal
Utilize educational technology to better engage students.

Project Description
Deploy new technologies across the school district focusing on technologies for the classroom and infrastructure needed to support the classroom. Technologies to consider include, but are not limited to, computers and mobile devices for students and teachers, interactive whiteboards, LCD projectors for the classrooms, and on-demand educational content. These devices transform classrooms from a place where students sit and observe to a model of engagement in which each student becomes a resource in the class. Further, smartphones can be utilized to easily automate district initiatives to cut truancy, report problems, and distribute emergency plans.

Benefits
1. Laptops, netbooks, and tablets enable greater instruction flexibility and formative assessment, key components of individual learning plans.
2. Used to support both teaching and learning, these technologies infuse classrooms with digital learning tools, expand course offerings and learning materials, increase student engagement and motivation, and accelerate learning by empowering educators to customize the curriculum to student needs.
3. Adding technology to the classroom can create a learning environment that's collaborative and meaningful to students; rather than just learning by rote, students can use technology to discover and synthesize information, putting it in a context that has meaning and validity.

Action Items
1. Encourage your community's education leaders to keep careful data and do their own research on what technologies are most appropriate for their student and instructor needs.
2. Assess which technology will give your school districts the best return for their investment and what kind of infrastructure is needed to support the technology.
3. Investigate funding sources for technology purchases. Providers, such as AT&T, assist schools in deploying technologies through the use of a variety of professional services, beginning with web security and filtering options for CIPA compliance, to deployment services like laptop imaging, asset tagging, direct drop shipment, reporting, comprehensive support options for either the student or the IT shop, and a variety of leasing options.

Improve Access to Online Education Opportunities

Goal

Improve access to online education opportunities and empower students and educators with comprehensive infrastructure for learning when and where they need it.

Project Description

To meet this goal, the U.S. Department of Education recommends the following:

- Ensure students and educators have broadband access to the Internet and adequate wireless connectivity both in and out of school.

- Ensure that every student and educator has at least one Internet access device and appropriate software and resources for research, communication, multimedia content creation, and collaboration for use in and out of school.

- Support the development and use of open educational resources to promote innovative and creative opportunities for all learners, and accelerate the development and adoption of new open technology-based learning tools and courses. Open education resources are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits sharing, accessing, repurposing, and collaborating with others.

- Build and support state and local education capacity for an evolving educational technology infrastructure. The effort should start with implementing the next generation of computing system architectures and include transitioning computer systems, software, and services from in-house datacenters to professionally managed datacenters in the cloud for greater efficiency and flexibility.

Benefits

1. Makes learning opportunities available to learners, educators, and administrators regardless of their location, the time of day, or the type of access devices.
2. Frees learning from a rigid information-transfer model (from book or educator to students) and enables a much more motivating intertwine of learning about, learning to do, and learning to be, better preparing students for post-secondary education and the workforce.

Action Items

1. Improving access and transitioning curriculums to include online learning necessitates policies and sustainable models for continuous improvement in addition to broadband connectivity, servers, software, management systems, and administrative tools.
2. E-Rate provisions and CIPA requirements should be examined, and schools and districts should explore the ways that student-owned devices can aid in learning. The use of

devices owned by students will require advances in network filtering and improved support systems.

3. Local school districts should develop new policies concerning the evaluation and selection of instructional materials so that digital resources are considered and processes are established for keeping education resource content up to date, appropriate, and tagged according to identified content interoperability standards.
4. Identify a professional educator who can engage with educators on leveraging technology for improving their professional practice. School technology coordinators, librarians, and media specialists may play this important role.
5. Work with the school district to identify options for reducing the number of servers they run through consolidation using virtualization. Virtualization allows a single server to run multiple applications safely and reliably, so that districts can reduce the number of servers on their networks dramatically, cutting costs and making the networks less complex and easier to manage.

Government

Improve Public Safety Communications

Goal
Leverage broadband technologies to enhance emergency communications to and from the public.

Project Description
Broadband offers a unique opportunity to achieve a comprehensive vision for enhancing the safety and security of your community's residents. Broadband can help public safety personnel prevent emergencies and respond swiftly when they occur. Broadband can also provide your community with new ways of calling for help and receiving emergency information.

For example, first responders from different jurisdictions and agencies often cannot communicate during emergencies due to disparate communication systems and the lack of integration between these systems. However, wireless broadband supports the interoperability of communications systems that would allow first responders anywhere in the nation to communicate with each other and send and receive critical voice and data to save lives, reduce injuries, and prevent acts of crime and terror.

Furthermore, with broadband, 911 call centers (also known as public safety answering points or PSAPs) could receive texts, pictures, and videos from the public and relay them to first responders. Similarly, the government could use broadband networks to disseminate vital information to the public during emergencies in multiple formats and languages.

To overcome the challenges posed by disparate communication systems and dated technology, your community's public safety agencies should collaborate with state and federal agencies in order to improve communication across organizational and jurisdictional boundaries. This is one of the priorities of the First Responder Network Authority (FirstNet). Created by the Middle Tax Relief and Job Creation Act of 2012, FirstNet was established as an independent authority within the National Telecommunications and Information Administration (NTIA) in order to establish a single nationwide, interoperable public safety broadband network.

To find out more information on FirstNet and the Nationwide Public Safety Network, visit http://www.ntia.doc.gov/category/firstnet.

To find out more information regarding your state's efforts and point of contact for FirstNet planning, check with your Governor's office and/or statewide interoperability coordinator.

Other relevant initiatives include:
Assistance to Firefighters Grants (AFG): The primary goal of the AFG Program is to meet the firefighting and emergency response needs of fire departments and non-affiliated emergency medical service organizations. AFG funds have helped firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards.

Community Connect Grant Program: The Community Connect Grant Program provides financial assistance to furnish broadband service in unserved, often isolated, rural communities. The grants are used to establish broadband service for critical facilities such as fire or police stations, while also providing service to residents and businesses.

Benefits

1. Provide enhanced 911 services and support of wireless device technologies and video in addition to traditional land-line calling. This will allow callers to use personal devices such as smart phones and tablets to not only text but also send actual video, thereby giving the responders a visual of the emergency situation.

2. Development of a "Next Generation 911 Call Management" system that will allow call centers to work together and be connected via a broadband network.

Perform a Municipal Information Technology Assessment

Goal

Determine overall IT operational efficiency and establish an informed process for strategic IT decisions.

Project Description
Conduct a Community IT Assessment of current environment performed through an interview process (onsite, videoconferencing, e-mail/web-based) to determine overall IT operational efficiency. Once complete, an end deliverable provides detailed assessment results including a relative "grade" in each area as well as suggested action plans for any areas that are found to be below standards.

Benefits
1. Eliminates performance gaps, redundancies, inefficiencies, and unintended information silos.
2. Assists in providing a clear, repeatable, streamlined, and informed process for making strategic IT decisions.

Action Items
1. Identify a complete list of all IT equipment including age, condition, and capacity/specifications currently in use.
2. Assess server infrastructure (hardware, operating systems, and storage) and network topology (design, cable plant, and Internet connectivity).
3. Identify all currently used applications/uses and backup procedures.
4. Identify and assess security measures (firewall, perimeter, physical and wireless security).
5. Identify "Best Practices" for each office as appropriate.

Improve the Online Presence of Government

Goal
The goal should be to make the website relevant, useful, convenient, and the go-to for local information and services.

Project Description
The government's website must meet the needs of the citizen; should equal or exceed the standards of private company websites; design must be uncluttered, informative, and easy to navigate; and website best practices must be continuously monitored and implemented. Further, website administrators should be funded and required to follow the latest best practices in design and web search optimization. They should have a process for archiving content that is no longer in frequent use and no longer required to be posted on the website. In addition, the local government should regularly solicit public opinion and analyze citizens' online preferences before making changes to their website or before launching a new website.

Benefits
1. Makes government more efficient, resulting in greater public convenience and cost effectiveness.

2. Improves the quality and accessibility of government information, and helps agencies deliver the services most requested by their customers.

Action Items

1. Review the current e-government applications to identify gap areas. Compare current applications to other comparable government websites of like size from around the state to identify potential improvement areas.
2. Conduct an assessment of the usability of current applications.
3. Use current and draft survey instruments to identify applications of public interest. Use this survey to examine potential e-government applications.
4. Identify high-volume services to target for online automation. Emergency and first responder applications will be included.
5. Identify partners and entities to assist in implementation.
6. Develop and launch applications.

Improve Online Business Services Offered by the Government

Goal

Build an e-government solution that improves the ability of businesses to conduct business with the government over the Internet.

Project Description

Developing more e-government applications not only provides value to businesses, but also allows the government to realize cost savings and achieve greater efficiency and effectiveness. Examples of activities include paying for permits and licensing, paying taxes, providing services to the government, and other such transactions.

Benefits

1. Facilitates business interaction with government, especially for urban planning, real estate development, and economic development.
2. E-government lowers the cost to a business conducting all of its interaction with government. Further, as more businesses conduct their business with government online, their transaction costs will be lowered. The cost to a business for any interaction decreases as more technology and fewer staff resources are needed.
3. E-government provides a greater amount of information to businesses and provides it in a more organized and accessible manner.

Action Items

1. The first step in the process of providing e-government services to constituents is developing a functional web portal that allows businesses to have access to resources easily. Such a portal can enable outside businesses looking for new opportunities to make informed decisions about working in a certain community.

2. In addition, often overlooked in e-government deployment are the issues of audiences and needs. Local governments must determine who will visit the website and what sort of information and services they will typically seek. A first step toward meeting general needs of constituents is to provide online access to as broad a swath of governmental information and data as is possible. The sort of information that should be included is:
    a. Hours of operation and location of facilities.
    b. Contact information of key staff and departments.
    c. An intuitive search engine.
    d. Access to documents (ideally a centralized repository of online documents and forms).
    e. Local ordinances, codes, policies, and regulations.
    f. Minutes of official meetings and hearings.
    g. News and events.

Pursue Next Generation 911 Upgrades

Goal

Design a system that enables the transmission of voice, data, or video from different types of communication devices to Public Safety Answering Points (PSAPs) and onto emergency responder networks.

Project Description

The overall system architecture of PSAPs has essentially not changed since the first 911 call was made in 1968. These 911 systems are voice-only networks based on original wireline, analog, circuit-switched infrastructure that prevents easy transmission of data and critical sharing of information that can significantly enhance the decision-making ability, response, and quality of service provided to emergency callers. To meet growing public expectations of 911-system functionality (capable of voice, data, and video transmission from different types of communication devices), that framework should be replaced. This would require replacing analog phone systems with an Internet Protocol (IP)-based system. This system would provide an enabling platform for current technology, as well as future upgrades.

For example, in January 2013, the Federal Communications Commission proposed to amend its rules by requiring all wireless carriers and providers of "interconnected" text messaging applications to support the ability of consumers to send text messages to 911 in all areas throughout the nation where 911 PSAPs are also prepared to receive the texts (which requires an IP-based system). Text-to-911 will provide consumers with enhanced access to emergency communications in situations where a voice call could endanger the caller, or a person with disabilities is unable to make a voice call. In the near term, text-to-911 is generally supported as the first step in the transition to a Next Generation 911.

Benefits

1. Transitioning to a "Next Generation" IP-based network will enable the public to make voice, text, or video emergency calls from any communications device. With Next Generation 911, responders and PSAPs will gain greater situational awareness, which will enable better-informed decisions, resulting in better outcomes and, ultimately, a safer community. By capitalizing on advances in technologies, you are enabling:
    a. Quicker and more accurate information to responders;
    b. Better and more useful forms of information;
    c. More flexible, secure and robust PSAP operations; and
    d. Lower capital and operating costs.

Action Items

If you're involved in PSAP decision making and are faced with replacing aging systems or purchasing new technology for the very first time, consider what your most immediate requirements are and where your community needs to be 10 years from now. Your community can take a measured and practical approach that spreads the operational impact and costs of a Next Generation 911 transition over time. Your local agency should choose a starting point that makes the most sense and provides immediate benefits for their PSAP, responders, and communities they serve. For example, according to Intrado, Inc., a provider of 911 and emergency communications infrastructure to over 3,000 public safety agencies, local public-safety agencies can implement any of the following next-generation 911 components today, and provide immediate benefits with little to no disruption of current operations:

    a. A public-safety-class, IP-based network
    b. IP-based call processing equipment (CPE) in PSAPs
    c. Geographic information system (GIS) data enhancements
    d. Advanced 911 data capabilities and applications

Healthcare

Promote Telemedicine in Remote Areas

Goal

Deliver improved healthcare services to rural residents.

Project Description

Promote the delivery of healthcare services from a distance using video-based technologies. Telemedicine can help to address challenges associated with living in sparsely populated areas and having to travel long distances to seek medical care – particularly for patients with chronic illnesses. It also addresses the issue of the lack of medical specialists in remote areas by awarding access to specialists in major hospitals situated in other cities, states, or countries. While telemedicine can be delivered to patient homes, it can also be implemented

in partnership with local clinics, libraries, churches, schools, or businesses that have the appropriate equipment and staff to manage it. The most critical steps in promoting telemedicine are ensuring that patients and medical professionals have access to broadband service, understanding the main features of telemedicine, being aware of the technologies required for telemedicine, and understanding how to develop, deliver, use, and evaluate telemedicine services.

One relevant funding opportunity includes Distance Learning and Telemedicine Loans and Grants Program. USDA provides loans and grants to rural community facilities (e.g., schools, libraries, hospitals, and tribal organizations) for advanced telecommunications systems that can provide healthcare and educational benefits to rural areas. Three kinds of financial assistance are available: a full grant, grant-loan combination, and a full loan.

APPENDIX 1: STATEWIDE PERSPECTIVE OF BROADBAND

Statewide Infrastructure

As part of the Tennessee State Broadband Initiative (SBI), and in partnership and at the direction of the State of Tennessee, Connected Tennessee produced an inaugural map of broadband availability in spring 2010. The key goal of the map was to highlight communities and households that remain unserved or underserved by broadband service; this information was essential to estimating the broadband availability gap in the state and understanding the scope and scale of challenges in providing universal broadband service to all citizens across the state. Since the initial map's release, Connected Tennessee has collected and released new data every six months, with updates in April and October annually.

The most current Statewide and County Specific Broadband Inventory Maps released in the fall of 2014 depict a geographic representation of provider-based broadband data represented by cable, DSL, fiber, fixed wireless and mobile wireless. These maps also incorporate data such as political boundaries and major transportation networks in the state. A statewide map is found at http://www.connectedtn.org/mapping/state. The county maps are found at http://www.connectedtn.org/community_profile/find_your_county/tennessee/montgomery.

Table 1: Estimate of Broadband Service Availability in the State of Tennessee By Speed Tier Among Fixed Platforms

SBI Download/Upload Speed Tiers	Unserved Households ('000)	Served Households ('000)	Percent Households by Speed Tier
At Least 768 Kbps/200 Kbps	88	2,406	96.49
At Least 1.5 Mbps/200 Kbps	99	2,394	96.02
At Least 3 Mbps/768 Kbps	163	2,331	93.46
At Least 6 Mbps/1.5 Mbps	299	2,195	88.01
At Least 10 Mbps/1.5 Mbps	304	2,190	87.81
At Least 25 Mbps/1.5 Mbps	405	2,089	83.76
At Least 50 Mbps/1.5 Mbps	426	2,068	82.93
At Least 100 Mbps/1.5 Mbps	457	2,037	81.68
At Least 1 Gbps/1.5 Mbps	2,223	271	10.87

Source: Connected Tennessee, January 2015.

Table 1 reports updated summary statistics of the estimated fixed, terrestrial broadband service inventory (excluding mobile and satellite service) across the state of Tennessee; it presents the number and percentage of unserved and served households by speed tiers. The

total number of households in Tennessee in 2010 was 2,493,552, for a total population of 6,346,105 people. Table 1 indicates that 96.49% of households are able to connect to broadband at download speeds of at least 768 Kbps and upload speeds of at least 200 Kbps. This implies that the number of households originally estimated by Connected Tennessee to be unserved has dropped from 131,000 households in the fall of 2010 to 87,541 households in the fall of 2014. Further, approximately 2,330,519 households across Tennessee have broadband available of at least 3 Mbps download and 768 Kbps upload speeds. The percentage of Tennessee households having fixed broadband access available of at least 6 Mbps download and 1.5 Mbps upload speeds is estimated at 88.01%.

Taking into account both fixed and mobile broadband service platforms, an estimated 99.87% of Tennessee households have broadband available from at least one provider at download speeds of 768 Kbps or higher and upload speeds of 200 Kbps or higher. This leaves 3,150 households in the State completely unserved by any form of terrestrial broadband (including mobile, but excluding satellite services).

As differences in broadband availability estimates between the fall of 2010 and the fall of 2014 show, additional participating broadband providers can have a large impact upon Tennessee broadband mapping inventory updates. Further, the measured broadband inventory provides an estimate of the true extent of broadband coverage across the state. There is a degree of measurement error inherent in this exercise, which should be taken into consideration when analyzing the data. This measurement error will decrease as local, state, and federal stakeholders, identify areas where the displayed coverage is underestimated or overestimated. Connected Tennessee welcomes such feedback to be analyzed in collaboration with broadband providers to correct errors identified in the maps.

In addition, the broadband availability data collected, processed, and aggregated by Connected Tennessee has been sent on a semi-annual basis to the NTIA to be used in the National Broadband Map, and comprises the source of Tennessee's broadband availability estimates reported by the NTIA and the FCC in the National Broadband Map. The National Broadband Map can be found here: http://www.broadbandmap.gov and the Map's specific page for Tennessee can be found here: http://www.broadbandmap.gov/summarize/state/tennessee.

Interactive Map

Connected Tennessee provides My ConnectView™, an online interactive map developed and maintained by Connected Nation, intended to allow users to create completely customized views and maps of broadband infrastructure across the state. The self-service nature of this application empowers Tennessee's citizens to take an active role in seeking service, upgrading service, or simply becoming increasingly aware of what broadband capabilities and possibilities exist in their area, city, county, or state.
http://www.connectedtn.org/interactive-map

For additional maps and other related information, visit:
http://www.connectedtn.org/broadband-landscape.

Business and Residential Technology Assessments

To complement the broadband inventory and mapping data, Connected Tennessee periodically conducts statewide residential and business technology assessments to understand broadband demand trends across the state. The purpose of this research is to better understand the drivers and barriers to technology and broadband adoption and estimate the broadband adoption gap across the state of Tennessee. Key questions the data address are: who, where, and how are households in Tennessee using broadband technology? How is this technology impacting Tennessee households and residents? Who is not adopting broadband service and why? What are the barriers that prevent citizens from embracing this empowering technology?

Through Connected Tennessee's research, many insights are able to be collected. The most recent residential technology assessment revealed the following key findings:

- Broadband adoption in Tennessee increased by 10 percentage points between 2010 (58%) and 2012 (68%).
- Nearly 1.6 million adults in Tennessee are without broadband access at their home, including approximately 776,000 who do not use the Internet at all.
- More than 1.4 million Tennesseans use the Internet at their jobs, while nearly one in six employed adults (14%) or approximately 406,000 Tennesseans work at home using an Internet connection instead of commuting.

Additionally, an assessment on technology in businesses released in 2012 in a report titled *Technology Adoption among Tennessee Businesses* revealed the following key findings:

- Across Tennessee, 72% of businesses subscribe to broadband service, a significant increase from 2010 when 65% of businesses subscribed.
- Tennessee businesses that use broadband report median annual revenues approximately $300,000 higher than businesses that do not use broadband.
- Online sales in Tennessee account for approximately $4.4 billion in annual sales revenue, including approximately $1.2 billion for businesses owned by women or minorities.

For more information on the statewide information described, visit the Connected Tennessee website at http://www.connectedtn.org/research.

APPENDIX 2: PARTNER AND SPONSORS

Connected Tennessee, in public-private partnership with the State of Tennessee, supports the advancement of Tennessee's economic competitiveness through increased innovation, job creation, and entrepreneurship via expansion of the state's broadband landscape and increased technology access, adoption, and use among Tennessee residents, businesses, and anchor institutions. In 2007, Connected Tennessee partnered with the State of Tennessee to engage in a comprehensive broadband data collection, asset mapping, and technology planning and adoption initiative. The program began by gathering provider data to create and maintain a statewide broadband map and by facilitating local technology planning efforts that identified priorities and targeted specific action steps on a community-by-community basis. These efforts served as a precursor to a national effort to map and expand broadband which continues today. At this point the program maintains and updates the Tennessee broadband inventory, conducts demand-side market research and analysis among Tennessee residents and businesses, and has expanded to include technical assistance support including community technology assessment, evaluation, identification of opportunities with existing programs, and planning and implementation of technology projects designed to address digital literacy, improve education, give residents access to global Internet resources, and stimulate economic development.
http://www.connectedtn.org/

Connected Nation (Connected Tennessee's parent organization) is a leading technology organization committed to bringing affordable high-speed Internet and broadband-enabled resources to all Americans. Connected Nation effectively raises the awareness of the value of broadband and related technologies by developing coalitions of influencers and enablers for improving technology access, adoption, and use. Connected Nation works with consumers, community leaders, states, technology providers, and foundations, including the Bill & Melinda Gates Foundation, to develop and implement technology expansion programs with core competencies centered on a mission to improve digital inclusion for people and places previously underserved or overlooked.
http://www.connectednation.org

The **National Telecommunications and Information Administration** (**NTIA**) is an agency of the United States Department of Commerce that is serving as the lead agency in running the State Broadband Initiative (SBI). Launched in 2009, the NTIA's State Broadband Initiative (SBI) implements the joint purposes of the Recovery Act and the Broadband Data Improvement Act, which envisioned a comprehensive program, led by state entities or non-profit organizations working at their direction, to facilitate the integration of broadband and information

technology into state and local economies. Economic development, energy efficiency, and advances in education and healthcare rely not only on broadband infrastructure but also on the knowledge and tools to leverage that infrastructure.

The NTIA has awarded a total of $293 million for the SBI program to 56 grantees, one each from the 50 states, 5 territories, and the District of Columbia, or their designees. Grantees such as Connected Tennessee are using this funding to support the efficient and creative use of broadband technology to better compete in the digital economy. These state-created efforts vary depending on local needs but include programs to assist small businesses and community institutions in using technology more effectively, developing research to investigate barriers to broadband adoption, searching out and creating innovative applications that increase access to government services and information, and developing state and local task forces to expand broadband access and adoption.

Since accurate data is critical for broadband planning, another purpose of the SBI program has been to assist states in gathering data twice a year on the availability, speed, and location of broadband services, as well as the broadband services used by community institutions such as schools, libraries, and hospitals. This data is used by the NTIA to update the National Broadband Map, the first public, searchable nationwide map of broadband availability launched February 17, 2011.

APPENDIX 3: THE NATIONAL BROADBAND PLAN

The National Broadband Plan, released in 2010 by the Federal Communications Commission, has the express mission of creating a high-performance America – a more productive, creative, efficient America in which affordable broadband is available everywhere and everyone has the means and skills to use valuable broadband applications. The plan seeks to ensure that the entire broadband ecosystem – networks, devices, content, and applications – is healthy.
The plan recommends that the country adopt and track the following six goals to serve as a compass over the next decade:

- **GOAL No. 1**: At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second.

- **GOAL No. 2**: The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.

- **GOAL No. 3**: Every American should have affordable access to robust broadband service and the means and skills to subscribe if they so choose.

- **GOAL No. 4**: Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.

- **GOAL No. 5**: To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.

- **GOAL No. 6**: To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

To learn more, visit: www.broadband.gov.

APPENDIX 4: WHAT IS CONNECTED?

The goal of Connected Tennessee's Connected program is to empower locally informed and collaborative technology planning that addresses each community's need for improved access, adoption, and use of technology:

- **ACCESS:** Does your community have access to affordable and reliable broadband service?
- **ADOPTION:** Is your community addressing the barriers to broadband adoption?
- **USE:** Are residents using technology to improve their quality of life?

Connected Nation leverages state-based public-private partnerships to engage residents at the local level. Regionally based staff provide "train-the-trainer" activities to local leaders, such as librarians, school administrators, economic development professionals, and public officials and help them organize multi-sector technology planning teams, inventory local technology resources and initiatives, assess local technology access, adoption, and use, and develop local strategies that target specific technology gaps in the community.

Connected's community technology-planning framework is cyclical. As with other forms of community planning – and especially so with technology planning – change is the only constant. At the community level, changing technology requirements, shifting demographics, economic drivers, and workforce requirements may expose or create new digital divides. Connected's community technology planning framework supports a sustained effort.

Connected Planning Process
Connected's community technology planning framework provides a clear path for the sustainable acceleration of broadband access, adoption, and use.

Step 1: Engage. Successful strategies to bridge the local digital divide and increase broadband access, adoption, and use are predicated on broad and sustained stakeholder participation. A successful local technology planning team should include people from multiple sectors, including:

- State and Local Government
- Public Safety
- Education (K-12, Higher Ed)
- Library
- Business & Industry, Agriculture, Recreation and Tourism
- Healthcare
- Community Organizations
- Technology Providers

Step 2: Assess. The Connected planning process guides the local technology planning team through an assessment of community technology resources, strengths, assets, needs, and gaps in order to identify and develop strategies to address specific technology gaps and opportunities in the community. Bolstered by benchmarking data that had been gathered through Connected Tennessee's mapping and market research, the local technology planning team works with community members to benchmark local broadband access, adoption, and use via the Connected Assessment, which measures:

Access	Adoption	Use
1. Broadband Availability 2. Broadband Speeds 3. Broadband Competition 4. Middle Mile Access 5. Mobile Broadband Availability	6. Digital Literacy 7. Public Computer Centers 8. Broadband Awareness 9. Vulnerable Population Focus	10. Economic Opportunity 11. Education 12. Government 13. Healthcare

Step 3: Plan. Once community resources and needs are identified, the community planning team begins to identify local priorities and policies, programs, and technical solutions that will accelerate broadband access, adoption, and use. Connected Nation provides recommended actions based on best practices from communities across the United States.

Step 4: Act. The technology planning team works together to ensure that selected policies, programs, and technical solutions are adopted, implemented, improved, and maintained. The Connected program provides a platform for collaboration and the sharing of best practices between communities. Connected Nation also provides communications support to raise awareness of your community's efforts. For communities that measurably demonstrate proficiency in broadband access, adoption, and use in the Connected Assessment, Connected Nation offers Connected certification, a nationally recognized certification that provides an avenue for pursuing opportunities as a recognized, technologically advanced community.

APPENDIX 4: BLOG POST – RIVERS AND SPIRES FESTIVAL

Community Festival Highlights Broadband Through Gigabit Gaming

Filled with music, live entertainment, games, arts and crafts, and other fun activities, the Rivers and Spires Festival in Clarksville, TN is famous, drawing between 35,000 and 40,000 visitors to Clarksville each April. This year, the festival will showcase a new feature: gaming stations and wifi kiosks that allow visitors to tap directly into their gigabit network.

Clarksville, TN provides gigabit Internet, the fastest Internet to date, which allows for movie downloads in seconds, instantaneous page loads, and other features. Officials representing the Clarksville-Montgomery County Economic Development Council, electricity and telecommunications provider CDE Lightband, and others working with Connected Tennessee are giving residents and visitors a chance to test the network for themselves and experience firsthand what a gigabit connection really means.

The introduction of the gaming stations to the festival last April allowed 4,500 gamers to test the network. This year, even more players will be able to join in with 80 gaming stations available throughout the event. Experts who know the frustrations of slow network speeds while gaming will be able to instantly recognize the difference that gigabit Internet provides. New gamers will be able to experience the instantaneous reactions, fluid game play, quick action, and overall fun of online games through a successful connection.

"We're a gigabit city and we are trying to find avenues to advance what we're doing and put out information about it," said Cal Wray, Executive Director of the Economic Development Council and Community Champion for Clarksville. Clarksville began working with Connected Tennessee in the fall of 2014 and is now near achieving Connected community certification. Economic development, education, and tourism were all high-focus priorities on their action plan toward achieving certification.

Wifi kiosks in the downtown area will also be available during the festival, allowing visitors to use the Internet and explore the town online, while also testing one aspect of the Technology Action Plan.

"Visitors can interact with it to get information; see restaurants, events, historic sites, and things to do in the area. This provides more functionality and a better way to promote what's going on, but also while you're there you'll have wifi access," explained Christy Batts, Broadband Division Manager for CDE Lightband. CDE Lightband provides access to the fiber network which supports the gigabit connection and works with the city to provide the gaming platforms and wifi kiosks that highlight the capabilities. The kiosks will provide a 100 ft. radius of wifi access, as well as information about the city's history, upcoming events, and services. The kiosks at the Rivers and Spires Festival will be the first tests in a plan to potentially cover the downtown area in wifi.

The Rivers and Spires Festival is held April 16-18. With new technology available, the event is sure to bring even more fun and exciting opportunities to Clarksville. To learn more about gigabit Internet, wifi speeds, and other community initiatives across the nation, visit www.connectednation.org.

APPENDIX 5: GLOSSARY OF TERMS

3G Wireless - Third Generation - Refers to the third generation of wireless cellular technology. It has been succeeded by 4G wireless. Typical speeds reach about 3 Mbps.

4G Wireless - Fourth Generation - Refers to the fourth generation of wireless cellular technology. It is the successor to 2G and 3G. Typical implantations include LTE, WiMax, and others. Maximum speeds may reach 100 Mbps, with typical speeds over 10 Mbps.

A

ARRA - American Recovery and Reinvestment Act.

ADSL - Asymmetric Digital Subscriber Line - DSL service with a larger portion of the capacity devoted to downstream communications, less to upstream. Typically thought of as a residential service.

ATM - Asynchronous Transfer Mode - A data service offering by ASI that can be used for interconnection of customers' LAN. ATM provides service from 1 Mbps to 145 Mbps utilizing Cell Relay Packets.

B

Bandwidth - The amount of data transmitted in a given amount of time; usually measured in bits per second, kilobits per second, and megabits per second.

BIP - Broadband Infrastructure Program - Part of the American Recovery and Reinvestment Act (ARRA), BIP is the program created by the U.S. Department of Agriculture focused on expanding last mile broadband access.

Bit - A single unit of data, either a one or a zero. In the world of broadband, bits are used to refer to the amount of transmitted data. A kilobit (Kb) is approximately 1,000 bits. A megabit (Mb) is approximately 1,000,000 bits.

BPL - Broadband Over Powerline - An evolving theoretical technology that provides broadband service over existing electrical power lines.

BPON - Broadband Passive Optical Network - A point-to-multipoint fiber-lean architecture network system which uses passive splitters to deliver signals to multiple users. Instead of running a separate strand of fiber from the CO to every customer, BPON uses a single strand of fiber to serve up to 32 subscribers.

Broadband - A descriptive term for evolving digital technologies that provide consumers with integrated access to voice, high-speed data service, video-demand services, and interactive delivery services (e.g., DSL, cable Internet).

BTOP - Broadband Technology Opportunities Program - Part of the American Recovery and Reinvestment Act (ARRA), BTOP is the program created by the U.S. Department of Commerce focused on expanding broadband access, expanding access to public computer centers, and improving broadband adoption.

C

Cable Modem - A modem that allows a user to connect a computer to the local cable system to transmit data rather than video. It allows broadband services at speeds of five Mbps or higher.

CAP - Competitive Access Provider - (or "Bypass Carrier") A company that provides network links between the customer and the Inter-Exchange Carrier or even directly to the Internet Service Provider. CAPs operate private networks independent of Local Exchange Carriers.

Cellular - A mobile communications system that uses a combination of radio transmission and conventional telephone switching to permit telephone communications to and from mobile users within a specified area.

CLEC - Competitive Local Exchange Carrier - Wireline service provider that is authorized under state and federal rules to compete with ILECs to provide local telephone and Internet service. CLECs provide telephone services in one of three ways or a combination thereof: a) by building or rebuilding telecommunications facilities of their own, b) by leasing capacity from another local telephone company (typically an ILEC) and reselling it, or c) by leasing discreet parts of the ILEC network referred to as UNEs.

CMTS - Cable Modem Termination System - A component (usually located at the local office or head end of a cable system) that exchanges digital signals with cable modems on a cable network, allowing for broadband use of the cable system.

CO - Central Office - A circuit switch where the phone and DSL lines in a geographical area come together, usually housed in a small building.

Coaxial Cable - A type of cable that can carry large amounts of bandwidth over long distances. Cable TV and cable modem broadband service both utilize this technology.

Community Anchor Institutions (CAI) - Institutions that are based in a community and larger user of broadband. Examples include schools, libraries, healthcare facilities, and government institutions.

CWDM - Coarse Wavelength Division Multiplexing - Multiplexing (more commonly referred to as WDM) with less than 8 active wavelengths per fiber.

D

Dial-Up - A technology that provides customers with access to the Internet over an existing telephone line. Dial-up is much slower than broadband.

DLEC - Data Local Exchange Carrier - DLECs deliver high-speed access to the Internet, not voice. DLECs include Covad, Northpoint, and Rhythms.

Downstream - Data flowing from the Internet to a computer (surfing the net, getting e-mail, downloading a file).

DSL - Digital Subscriber Line - The use of a copper telephone line to deliver "always on" broadband Internet service.

DSLAM - Digital Subscriber Line Access Multiplier - A piece of technology installed at a telephone company's CO that connects the carrier to the subscriber loop (and ultimately the customer's PC).

DWDM - Dense Wavelength Division Multiplexing - A SONET term which is the means of increasing the capacity of Sonet fiber-optic transmission systems.

E

E-rate - A federal program that provides subsidy for voice and data lines to qualified schools, hospitals, Community-Based Organization (CBOs), and other qualified institutions. The subsidy is based on a percentage designated by the FCC.

Ethernet - A local area network (LAN) standard developed for the exchange data with a single network. It allows for speeds from 10 Mbps to 10 Gbps.

EON - Ethernet Optical Network - The use of Ethernet LAN packets running over a fiber network.

EvDO - Evolution Data Only - A new wireless technology that provides data connections that are 10 times faster than a regular modem.

F

FCC - Federal Communications Commission - A federal regulatory agency that is responsible for, among other things, regulating VoIP.

Fixed Wireless Broadband - The operation of wireless devices or systems for broadband use at fixed locations such as homes or offices.

Franchise Agreement - An agreement between a cable provider and a government entity that grants the provider the right to serve cable and broadband services to a particular area - typically a city, county, or state.

Franchise Agreement - An agreement between a cable provider and a government entity that grants the provider the right to serve cable and broadband services to a particular area - typically a city, county, or state.

FTTH - Fiber To The Home - Another name for fiber to the premises, where fiber optic cable is pulled directly to an individual's residence or building allowing for extremely high broadband speeds.

FTTN - Fiber To The Neighborhood - A hybrid network architecture involving optical fiber from the carrier network, terminating in a neighborhood cabinet that converts the signal from optical to electrical.

FTTP - Fiber To The Premise (Or FTTB - Fiber To The Building) - A fiber optic system that connects directly from the carrier network to the user premises.

G

Gbps - Gigabits per second - 1,000,000,000 bits per second or 1,000 Mbps. A measure of how fast data can be transmitted.

GPON - Gigabyte-Capable Passive Optical Network - Uses a different, faster approach (up to 2.5 Gbps in current products) than BPON.

GPS - Global Positioning System - A system using satellite technology that allows an equipped user to know exactly where he is anywhere on earth.

GSM - Global System for Mobile Communications - This is the current radio/telephone standard in Europe and many other countries except Japan and the United States.

H

HFC - Hybrid Fiber Coaxial Network - An outside plant distribution cabling concept employing both fiber optic and coaxial cable.

Hotspot - See Wireless Hotspot.

I

IEEE - Institute of Electrical and Electronics Engineers (pronounced "Eye-triple-E.").

ILEC - Incumbent Local Exchange Carrier - The traditional wireline telephone service providers within defined geographic areas. They typically provide broadband Internet service via DSL technology in their area. Prior to 1996, ILECs operated as monopolies having the exclusive right and responsibility for providing local and local toll telephone service within LATAs.

IP-VPN - Internet Protocol - Virtual Private Network - A software-defined network offering the appearance, functionality, and usefulness of a dedicated private network.

ISDN - Integrated Services Digital Network - An alternative method to simultaneously carry voice, data, and other traffic, using the switched telephone network.

ISP - Internet Service Provider - A company providing Internet access to consumers and businesses, acting as a bridge between customer (end-user) and infrastructure owners for dial-up, cable modem, and DSL services.

K

Kbps - Kilobits per second - 1,000 bits per second. A measure of how fast data can be transmitted.

L

LAN - Local Area Network - A geographically localized network consisting of both hardware and software. The network can link workstations within a building or multiple computers with a single wireless Internet connection.

LATA - Local Access and Transport Areas - A geographic area within a divested Regional Bell Operating Company is permitted to offer exchange telecommunications and exchange access service. Calls between LATAs are often thought of as long-distance service. Calls within a LATA (IntraLATA) typically include local and local toll telephone services.

Local Loop - A generic term for the connection between the customer's premises (home, office, etc.) and the provider's serving central office. Historically, this has been a wire connection; however, wireless options are increasingly available for local loop capacity.

Low Income - Low income is defined by using the poverty level as defined by the U.S. Census Bureau. A community's low-income percentage can be found at www.census.gov.

M

MAN - Metropolitan Area Network - A high-speed date intra-city network that links multiple locations with a campus, city, or LATA. A MAN typically extends as far as 50 kilometers (or 31 miles).

Mbps - Megabits per second - 1,000,000 bits per second. A measure of how fast data can be transmitted.

Metro Ethernet - An Ethernet technology-based network in a metropolitan area that is used for connectivity to the Internet.

Multiplexing - Sending multiple signals (or streams) of information on a carrier (wireless frequency, twisted pair copper lines, fiber optic cables, coaxial, etc.) at the same time. Mutiplexing, in technical terms, means transmitting in the form of a single, complex signal and then recovering the separate (individual) signals at the receiving end.

N

NTIA - National Telecommunications and Information Administration, which is housed within the United State Department of Commerce.

NIST - National Institute of Standards and Technology.

O

Overbuilders - Building excess capacity. In this context, it involves investment in additional infrastructure projects to provide competition.

OVS - Open Video Systems - A new option for those looking to offer cable television service outside the current framework of traditional regulation. It would allow more flexibility in providing service by reducing the build-out requirements of new carriers.

P

PON - Passive Optical Network - A Passive Optical Network consists of an optical line terminator located at the Central Office and a set of associated optical network terminals located at the customer's premises. Between them lies the optical distribution network comprised of fibers and passive splitters or couplers.

R

Right-of-Way - A legal right of passage over land owned by another. Carriers and service providers must obtain right-of-way to dig trenches or plant poles for cable and telephone systems and to place wireless antennae.

RPR - Resilient Packet Ring - Uses Ethernet switching and a dual counter-rotating ring topology to provide SONET-like network resiliency and optimized bandwidth usage, while delivering multi-point Ethernet/IP services.

RUS - Rural Utility Service - A division of the United States Department of Agriculture that promotes universal service in unserved and underserved areas of the country through grants, loans, and financing.

S

Satellite - Satellite brings broadband Internet connections to areas that would not otherwise have access, even the most rural of areas. Historically, higher costs and lower reliability have prevented the widespread implementation of satellite service, but providers have begun to overcome these obstacles, and satellite broadband deployment is increasing. A satellite works by receiving radio signals sent from the Earth (at an uplink location also called an Earth Station) and resending the radio signals back down to the Earth (the downlink). In a simple system, a signal is reflected, or "bounced," off the satellite. A communications satellite also typically converts the radio transmissions from one frequency to another so that the signal getting sent down is not confused with the signal being sent up. The area that can be served by a satellite is determined by the "footprint" of the antennas on the satellite. The "footprint" of a satellite is the area of the Earth that is covered by a satellite's signal. Some satellites are able to shape their footprints so that only certain areas are served. One way to do this is by the use of small beams

called "spot beams." Spot beams allow satellites to target service to a specific area, or to provide different service to different areas.

SBI - State Broadband Initiatives, formerly known as the State Broadband Data & Development (SBDD) Program.

SONET - Synchronous Optical Network - A family of fiber-optic transmission rates.

Streaming - A Netscape innovation that downloads low-bit text data first, then the higher bit graphics. This allows users to read the text of an Internet document first, rather than waiting for the entire file to load.

Subscribership - Subscribership is the number of customers that have subscribed for a particular telecommunications service.

Switched Network - A domestic telecommunications network usually accessed by telephones, key telephone systems, private branch exchange trunks, and data arrangements.

T

T-1 - Trunk Level 1 - A digital transmission link with a total signaling speed of 1.544 Mbps. It is a standard for digital transmission in North America.

T-3 - Trunk Level 3 - 28 T1 lines or 44.736 Mbps.

U

UNE - Unbundled Network Elements - Leased portions of a carrier's (typically an ILEC's) network used by another carrier to provide service to customers.

Universal Service - The idea of providing every home in the United States with basic telephone service.

Upstream - Data flowing from your computer to the Internet (sending e-mail, uploading a file).

V

VDSL (or VHDSL) - Very High Data Rate Digital Subscriber Line - A developing technology that employs an asymmetric form of ADSL with projected speeds of up to 155 Mbps.

Video On Demand - A service that allows users to remotely choose a movie from a digital library and be able to pause, fast-forward, or even rewind their selection.

VLAN - Virtual Local Area Network - A network of computers that behave as if they were connected to the same wire even though they may be physically located on different segments of a LAN.

VoIP - Voice over Internet Protocol - A new technology that employs a data network (such as a broadband connection) to transmit voice conversations.

VPN - Virtual Private Network - A network that is constructed by using public wires to connect nodes. For example, there are a number of systems that enable one to create networks using the Internet as the medium for transporting data. These systems use encryption and other security mechanisms to ensure that only authorized users can access the network and that the data cannot be intercepted.

Vulnerable Groups - Vulnerable groups will vary by community, but typically include low-income, minority, senior, children, etc.

W

WAN - Wide Area Network - A communications system that utilizes cable systems, telephone lines, wireless, and other means to connect multiple locations together for the exchange of data, voice, and video.

Wi-Fi - Wireless Fidelity - A term for certain types of wireless local networks (WLANs) that uses specifications in the IEEE 802.11 family.

WiMax - A wireless technology that provides high-throughput broadband connections over long distances. WiMax can be used for a number of applications, including last mile broadband connections, hotspots, and cellular backhaul and high-speed enterprise connectivity for businesses.

Wireless Hotspot - A public location where Wi-Fi Internet access is available for free or for a small fee. These could include airports, restaurants, hotels, coffee shops, parks, and more.

Wireless Internet - 1) Internet applications and access using mobile devices such as cell phones and palm devices. 2) Broadband Internet service provided via wireless connection, such as satellite or tower transmitters.

Wireline - Service based on infrastructure on or near the ground, such as copper telephone wires or coaxial cable underground, or on telephone poles.